ORDER NO. KM40112745C2

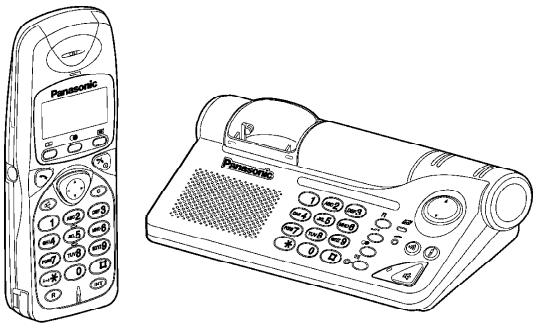
Service Manual

Telephone Equipment

Caller ID Compatible

KX-TCD715EM

Digital Cordless Phone
Metallic Grey Version
(for United Kingdom)



(HANDSET) (BASE UNIT)

SPECIFICATIONS

SPECIFICATION

Standard:	DECT=Digital Enhanced Cordless Telecommunications GAP=Generic Access Profile
Number of channels:	120 Duplex Channels
Frequency range:	1.88 GHz to 1.9 GHz
Duplex procedure:	Time Multiplex, 10 ms frame length
Channel Spacing:	1728 kHz
Bit rate spacing:	1152 kbit/s
Modulation:	GFSK
Voice coding:	32 kbit/s
Operation range:	Up to 300 m outdoors, up to 50 m indoors
Analog telephone connection:	Telephone Line / PBX
Power source:	AC Adaptor 230 V ~ /50 Hz
Power consumption, Base unit:	5 VA

Battery life, Handset (if batteries are fully charged):	Stand-by: Up to 200 hours (Ni-MH) Up to 100 hours (Ni-Cd) Talk: Up to 20 hours (Ni-MH) Up to 10 hours (Ni-Cd)
Operating conditions:	5 - 40˚C, 20 - 80% relative air humidity (not condensing)
Dialing modes:	Tone
Recall button (set default):	Flash (80 ms)
for PBX:	Flash (700 ms)
Recall button (option):	Earth (400 ms)
Dimensions, Base unit:	about 208 mm x 115 mm x 60 mm (L x W x D)
Dimensions, Handset:	about 136 mm x 47 mm x 31.5 mm (L x W x D)
Weight, Base unit:	about 380 g
Weight, Handset:	about 152 g
Telephone line cord length:	about 2.2 m
AC adaptor cord length:	about 1.9 m
Connection jack:	
Telephoneline cord:	RJ11 to UK telphone plug. 4-wire cable

Design and specification are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt tp service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

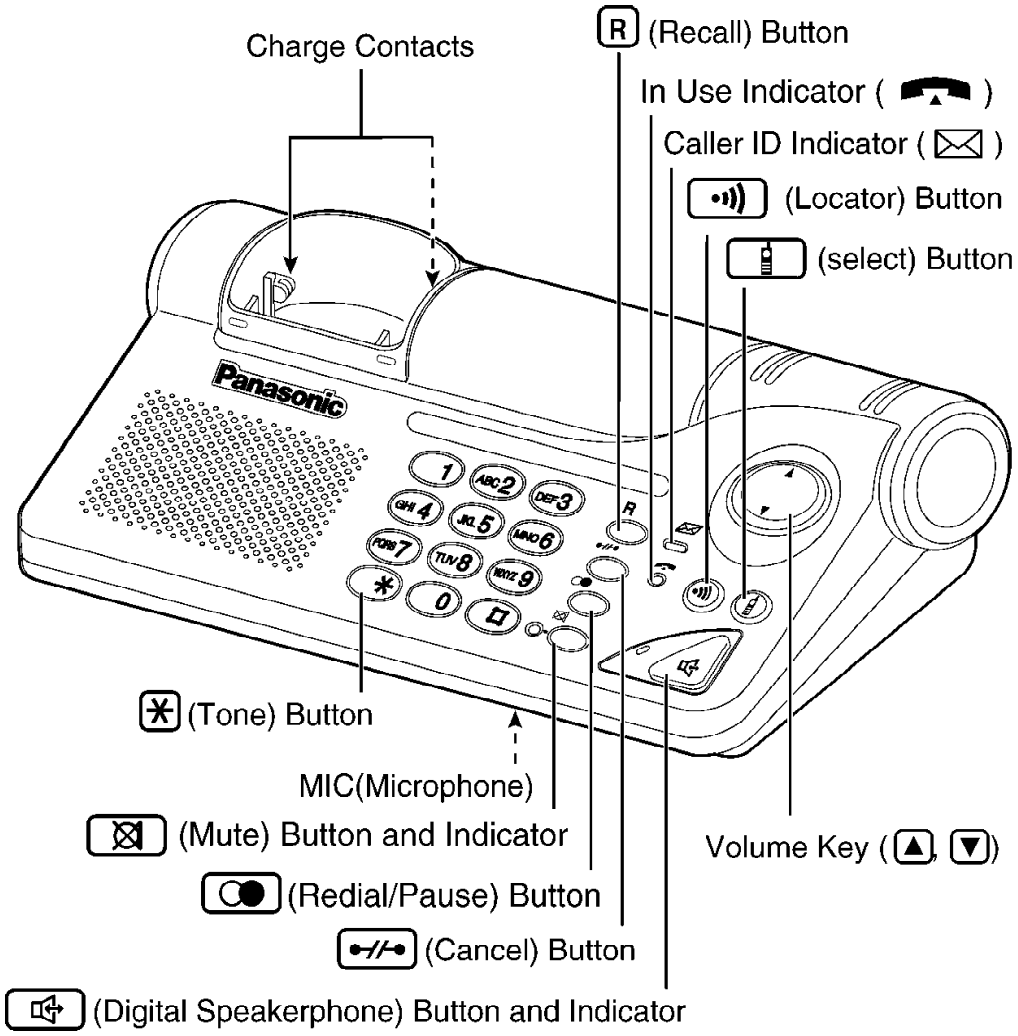
FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.
1. Cover plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on worktable.
4. Do not grasp IC or LSI pins with bare fingers.

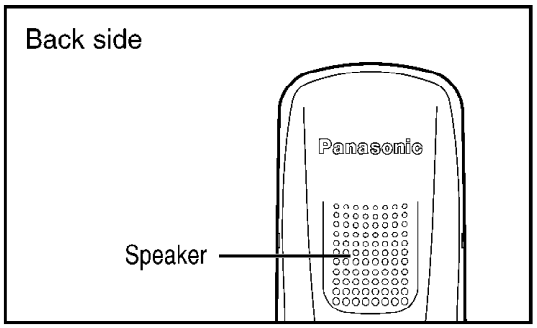
Panasonic

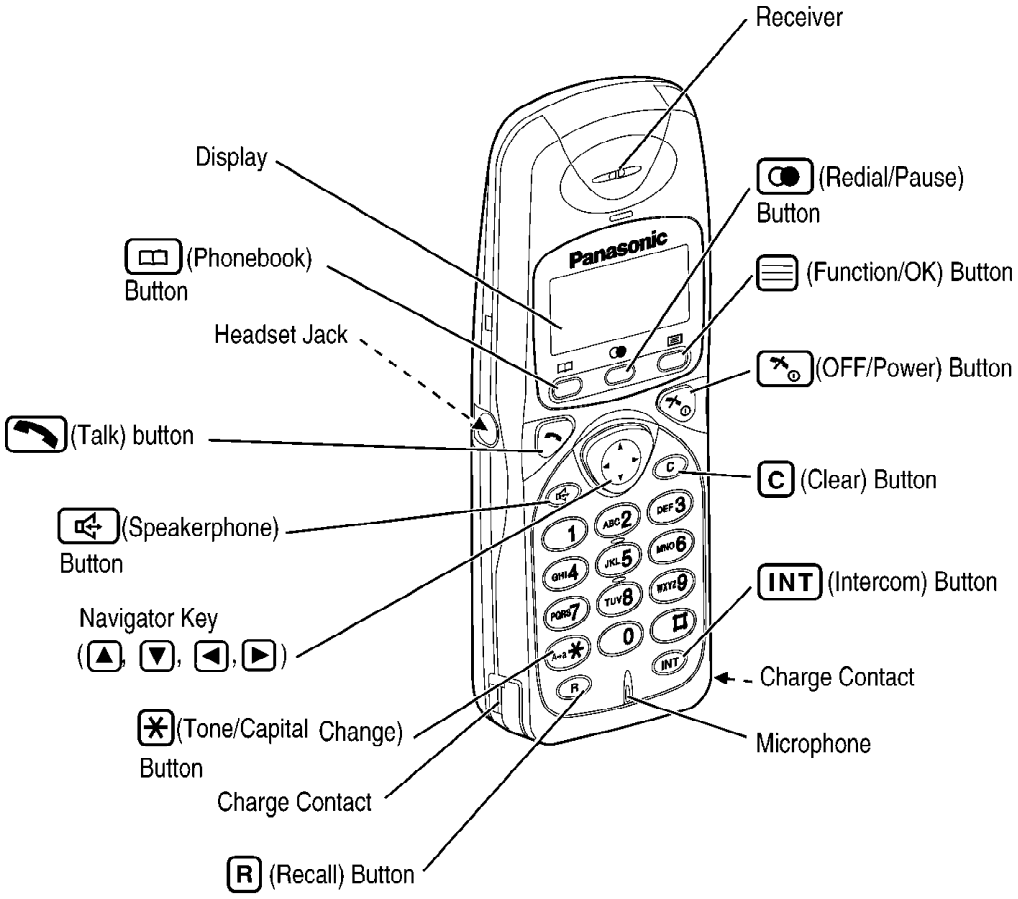
1. LOCATION OF CONTROLS

1.1. Base Unit

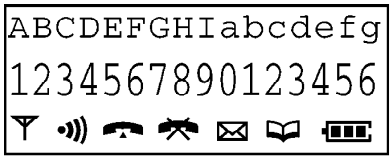

Charge Contacts
R (Recall) Button
In Use Indicator ( )
Caller ID Indicator ( )
(Locator) Button
(select) Button
Panasonic
(Tone) Button
MIC(Microphone)
(Mute) Button and Indicator
(Redial/Pause) Button
(Cancel) Button
(Digital Speakerphone) Button and Indicator
Volume Key (,)

1.2. Handset





2. DISPLAYS



2.1. Icons

The in-range icon indicates that the handset is in range of the base unit. It flashes when the handset is out of range.	The call prohibition icon is displayed when this mode is turned on.
The page/intercom icon is displayed when paging or using the intercom. It flashes when another unit pages the handset.	The phonebook icon is displayed when storing or viewing the phonehook items.
The talk icon is displayed when making or answering calls. It flashes when an external call is being received.	The battery icon indicates the battery strength.

2.2. Characters/Symbols

P "Pause" is selected while dialing.	F (R) is pressed while dialing.
↦ Direct call mode is ON.	[X] Key lock is ON.

2.3. Display Backlight

The handset has a backlight display. The display will light when you start using the handset and when a call is received. The handset display light will stay on for about 10 seconds after pressing a button or lifting the handset off the base unit. You can change the backlight colour for indentifying callers by setting the private category feature.

2.4. Lighted Handset Keypad

The handset dialling buttons will light when you press a button, lift the handset off the base unit or receive a call. The lights will go out about 10 seconds after pressing a button, lifting the handset or answering a call.

3. DISASSEMBLY INSTRUCUTIONS

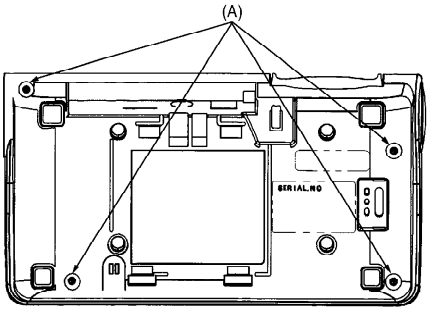


Fig. 1

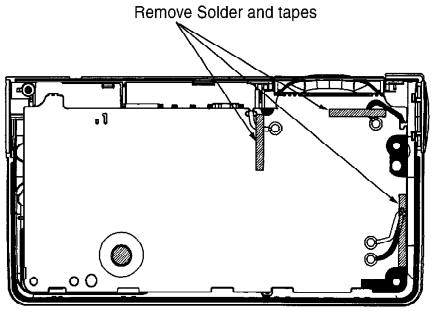


Fig. 2

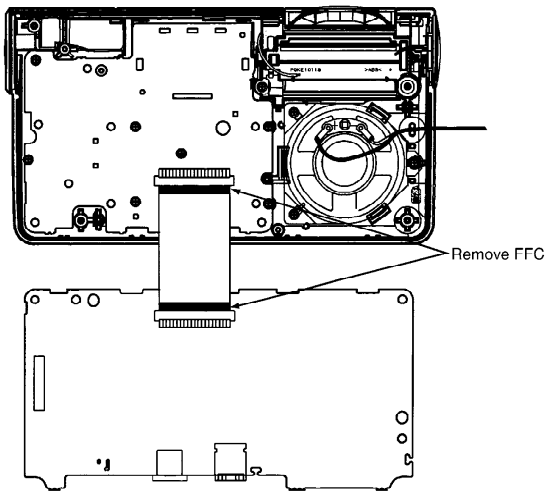


Fig. 3

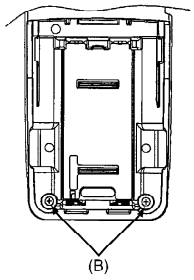


Fig. 4

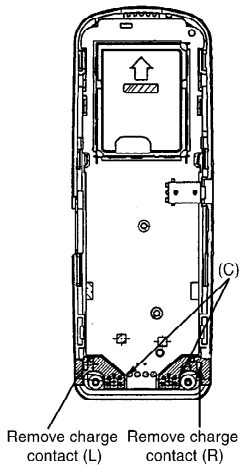
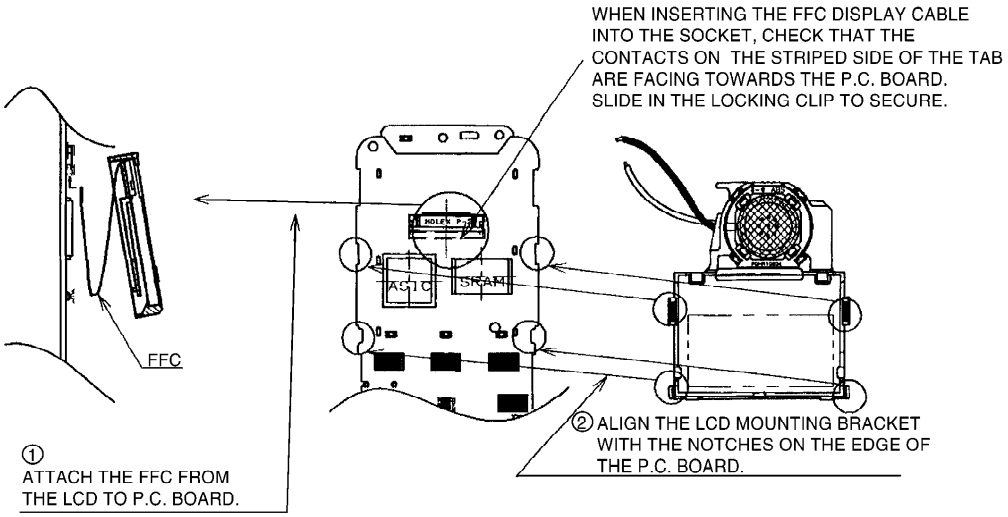
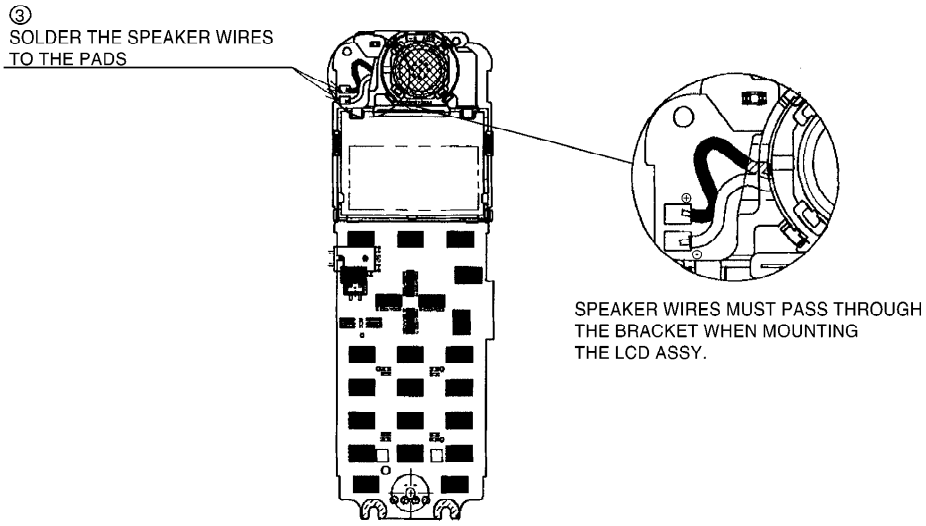


Fig. 5

Shown in Fig.	To Remove	Remove
1	Lower Cabinet	Screws (2.6 × 14).....(A) × 4
2	Main P.C.B of base	Remove solder and tapes
3	Main P.C.B of base	FFC
4	Rear Cabinet of handset	Screws (2 × 8).....(B) × 2
5	Main P.C.B of handset	Screws (2 × 6).....(C) × 2

3.1. Assembly the LCD to P.C. Board (Handset)

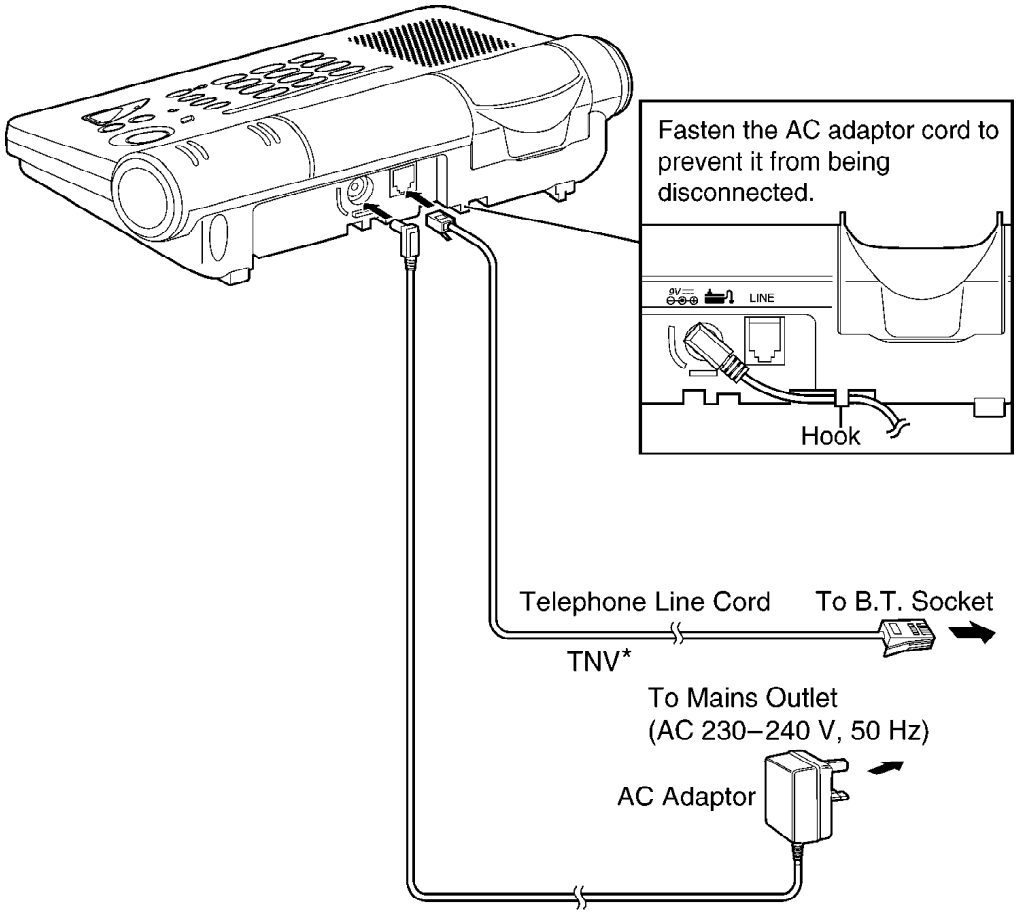

WHEN INSERTING THE FFC DISPLAY CABLE
INTO THE SOCKET, CHECK THAT THE
CONTACTS ON THE STRIPED SIDE OF THE TAB
ARE FACING TOWARDS THE P.C. BOARD.
SLIDE IN THE LOCKING CLIP TO SECURE.
FFC
① ATTACH THE FFC FROM THE LCD TO P.C. BOARD.
② ALIGN THE LCD MOUNTING BRACKET WITH THE NOTCHES ON THE EDGE OF THE P.C. BOARD.



4. SETTINGS

4.1. Connections

Plug in the AC Adaptor and the telephone line cord to the rear of the unit. Then connect the cord as shown.



USE ONLY WITH Panasonic AC ADAPTOR PQLV1EZ.

- The AC Adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)

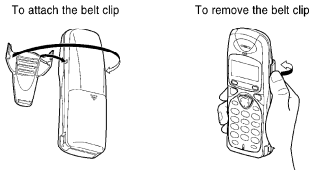
- This telephone has a single terminal which must be connected to an analog telephone line with a UK telephone connector.

- If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.

- The telephone will not work during a power failure. We therefore recommend you use a standard telephone and automatic change-over switch to connect this Digital Cordless Phone to the line. Your Panasonic Sales Shop can offer you more information about connection possibilities.

4.2. Using the Belt Clip

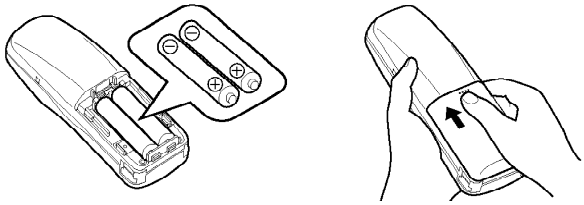
You can hang the handset on your belt or pocket using the belt clip.



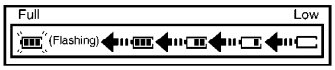
4.3. Batteries

4.3.1. Installing the Batteries in the Handset

• If the rechargeable batteries are not inserted correctly, the handset will not work.



4.3.2. Battery Charge



At the time of shipment, the batteries are not charged. To charge, place the handset on the base unit. Please charge the batteries for approximately 10 hours before initial use. During charging, the battery icon is as shown above.

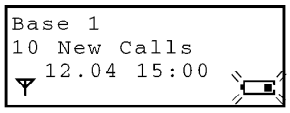
4.3.3. Battery Strength

You can check the present battery strength on the display.

Battery strength	Fully charged	High	Medium	Low	No power
Battery icon	(Flashing)				(Flashing)

4.3.4. Recharge

When "▭" flashes or the unit beeps every 15 seconds, recharge the batteries.



4.3.5. Battery Information

After your batteries are fully charged:

Operation	Ni-MH battery life (Included)	Ni-Cd battery life (optional)
While in use (Talk)	Up to about 20 hours	Up to about 10 hours (Based on 800 m/A per hour)
While not in use (Stand-By)	Up to about 200 hours	Up to about 100 hours

- Battery operation time may be shortened depending on usage conditions, such as:
- when viewing the Caller ID Caller List, or phonebook
- when talking in speakerphone mode,
- ambient temperature.
- Clean the handset and base unit charge contacts with a soft, dry

cloth.
Clean if the unit is subject to grease, dust or high humidity. Otherwise the batteries may not charge properly.

- If the batteries are fully charged, you do not have to place the handset on the base unit until"▭" flashes. This will maximize the battery life.

- The batteries cannot be overcharged.

- Nickel cadmium (Ni-Cd) rechargeable butteries (AA size) are available.
When you replace the batteries, you must program the battery type selection.

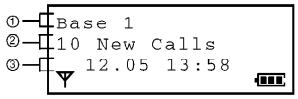
5. OPERATIONS

This section is intended to provide a basic overview for KX-TCD715EM.
For a full explanation, refer to the Operating Instructions.

5.1. Turning the Power On

Press and hold [⏻].

- After all the possible configurations briefly appear, the display will change to the following. Then the handset is in the standby mode.



① The current connected base unit number:
You can choose whether to display the base unit number, handset number or no display in the standby mode by programming.

② The number of new Caller ID calls received.

③ The current date and time:
After you set the date and time, the current date and time will be displayed.

To turn the power OFF, press and hold [⏻] until a beep sounds.

- The display will go blank.
- The handset will not ring.

5.2. Making a Call

With the Handset

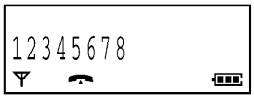
Make sure that the power is ON.

1 Press [ ].

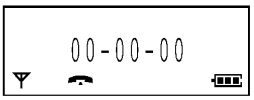
- " " is displayed.

2 Dial a phone number.

- The dialed number is displayed.



- After a few seconds, the display will show the length of the call.



3 To hang up, press [ ] or place the handset on the base unit.

- The handset will return to the standby mode.

To dial after confirming the entered number

1 Enter a phone number.

- The entered number is displayed.
- If you misdial, press [C]. Digits are erased from the right.
- To cancel, press and hold [C] or press [ ].

2 Press [ ].

- " " is displayed.
- After a few seconds, the display will start showing the length of the call.

3 To hang up, press [ ] or place the handset on the base unit.

- The handset will return to the standby mode.

To have a hands-free phone conversation (Using Digital Speakerphone)

1 Press [ ].

- The button lights.

2 Dial a phone number

- The dialed number is displayed.
- After a few seconds, the display will show the length of the call.

3 When the other party answers, talk into the microphone.

4 To hang up, press [ ] or place the handset on the base unit.

Hands-free Digital Speakerphone

For best performance, please note the following:

- Talk alternately with the caller in a quiet room.
- If the other party has difficulty hearing you, press [▼] to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press [▼] to decrease the speaker volume.
- While talking, you can switch to the hands-free phone conversation by pressing [ ]. To switch back to the receiver, press [ ] or [ ].

- If " " flashes and an alarm tone sounds after pressing [ ] or [ ], move closer to the base unit. Then try again.
- You can choose whether to display either the length of the call, call charge or phone number in the talk mode by programming.

To select the receiver volume (HIGH, MEDIUM or LOW) or speaker volume (6 levels) while talking

To increase, press ▲.

To decrease, press ▼.

Ex. Receiver volume: HIGH
Speaker volume: level 6

- Each time you press ▼ or ▲, the volume level will change.
- The display will return to the length of the call.

To redial the last number dialed

1 **Press** or .

2 **Press ☰.**

3 **While "Redial" is at the arrow, press ☰.**

- The last number dialed is automatically redialed.

Automatic Redial:
When using the hands–free degital speakerphone on the handset, the unit redials the last dialed number up to 12 times (every 40 seconds) if the line is busy. The digital speakerphone button lights and " -Muting- " is displayed while redialing.

To redial using the redial list

The last 10 numbers dialed are stored in the redial list.

1 **Press .**

- The last number dialed is displayed.

2 **Press ▼ or ▲ until the desired number is displayed.**

- To search from the most recent to the oldest number, press ▼. To search from the oldest to most recent number, press ▲.
- To exit the list, press C.

3 **Press or .**

- The number is dialed automatically

- If " No Stored Memory " is displayed in step1, the redial memory is empty.
  If your line has rotary or pulse service, any access number entered after pressing ✱ will not be included when redialling.
- If the same phone number is stored in the phonebook, the name will be displayed.

To store a redial number in the phonebook

While the desired number is displayed, press ☰, then see "To store an entered number in the phonebook", from step 3.

To clear a number in the redial memory

1 **While the desired number is displayed, press ☰.**

2 **Press ▼ or ▲ until the arrow points to "Clear", then press ▶.**

3 **Press ▼ or ▲ to select "YES", then press ☰.**

To clear all numbers in the redial memory

Select "All Clear" in step 2 above.

To store an entered number in the phonebook

1 **Enter a phone number**

- The entered number is displayed.
- If you misdial, press C. Digits are erased from the right.
- To cancel, press and hold C or press .

2 **Press ▶.**

3 **While "Save Phonebook" is at the arrow press ▶.**

- The display shows the number of remaining phonebook items, then "<Enter Name>".

4 **Enter a name, up to 16 characters with the dialing buttons, ◀ or ▶.**

- See the steps for entering names and symbols.

With the Base Unit (Digital Speakerphone)

1 Press [SPEAKER].
- The indicator lights.

2 Dial a telephone number.
- If you misdial, press [FLASH/REDIAL] then dial again.

3 When the other party answers, talk into the MIC.

4 To hang up, press [SPEAKER].
- The indicator light goes out.

- The base unit speaker phone cannot be used while a handset is in use. Wait until the in use indicator ( ) goes out.

To adjust the speaker volume (8 levels)

To increase, press [▲].

To decrease, press [▼].

To redial the last number dialed on the base unit

Press [SPEAKER] ➡ [REDIAL].

Hands-Free Digital Speakerphone

The digital speakerphone enhances your telephone conversation. For best performance, please note the following.
- Talk alternately with the caller in a quiet room.
- If the other party has defficulty hearing you, press [▼] to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press [▼] to decrease the speaker volume.

To mute your conversation

Press [MUTE] **while talking.**
- The mute indicator ( ) lights.
- The other party cannot hear your voice but you can hear theirs.
- To resume the conversation, press [MUTE] again.

5.3. Answering Call

If you subscribe to a Caller ID service, the calling party information will be displayed after the first ring. Please wait until the second ring to answer a call in order to view the Caller ID information.
You can also program the desired external ringer type.
Make sure that the power is ON, otherwise the handset will not ring.

With the Handset

If the handset is off the base unit;

1 Press [HANDSET] .
- You can also answer a call by pressing any dialing button [0] to [9], [*], [#] or [INT] (**–Any Key Talk**).

OR

Press [SPEAKER] **and when the other party answers, talk into the microphone.**

2 To hang up, press [HANDSET] **or place the handset on the base unit.**

Auto talk

If you set the AutoTalk feature to ON, you can answer a call by lifting the handset of the base unit without pressing [HANDSET] or [SPEAKER].

To turn the handset ringer off temporarily

When the handset starts ringing, press and hold [▼].
- "Ring Off" is displayed and the handset stops ringing.

- The ringer will turn back on for the next call.
- This function will not work when the handset is on the base unit.
- The handset and base unit will not ring if both ringer volumes are set to OFF.

With the Base Unit

1 Press [SPEAKER].

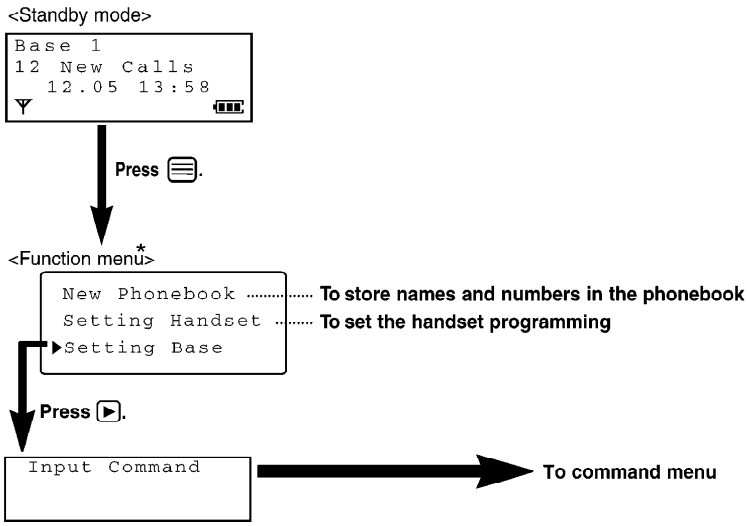
2 Talk into the MIC.

3 To hang up, press [SPEAKER].

5.4. Summary of Programmable Functions

You can program the following function items **using the handset near the base unit.** The display shows the instructions. After selecting "Setting Base", enter the desired function command. See the corresponding pages for function details.

Make sure that the power is ON and the unit is in the standby mode.



While programming:

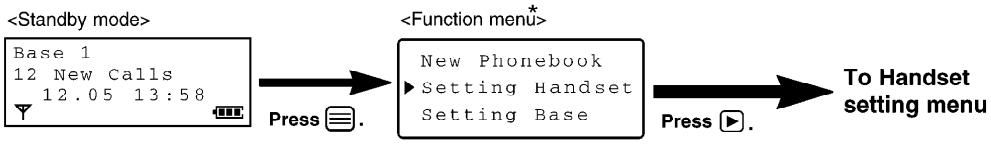
* To select a desired function item, press ▼ or ▲ until the arrow points to the item. Then press ▶ to go to the next step.
- You can press ☰ to go to the next menu of the function menu instead of pressing ▶.
- To return to the previous step during programming, press ◀ or C.
- You can exit the programming mode any time by pressing ⏻ and also can return to "Input Command" by pressing C.
- When programming is completed, a beep sounds.

Command menu

Command		Function item
1	1	To select the bell selection
2	1	To set the base unit key tone On/Off
	2	To select the base unit ringer volume
	3	To set the base unit ringer type
3	1	To select the dialing mode
	2	To select the earth/flash
	3	To set the pause time
4	1	To set the AKZ
	2	To set the HAKZ
5		To change the base unit PIN
6		To set the call restriction
7		To cancel the handset
8	0	To clear the total charge
	1	To check the total charge
	2	To store the charge rate
9	1	To store carrier code for ARS
	2	To store area code for ARS
	4	To relate area code(s) to a carrier code
0		To reset the base unit
*		To set time
*	*	To set date

Handset settings

You can program the following function items **using the handset near the base unit**. The display shows the instructions. After selecting "Setting Handset", the main menu is displayed. Most items in the main menu have a sub-menu. The sub-menu is shown after selecting the item in the main menu. See the corresponding pages for function details. Main menu items are written in bold and sub-menu items are under each main menu item on the next page.
Make sure that the power is ON and the unit is in the standby mode.

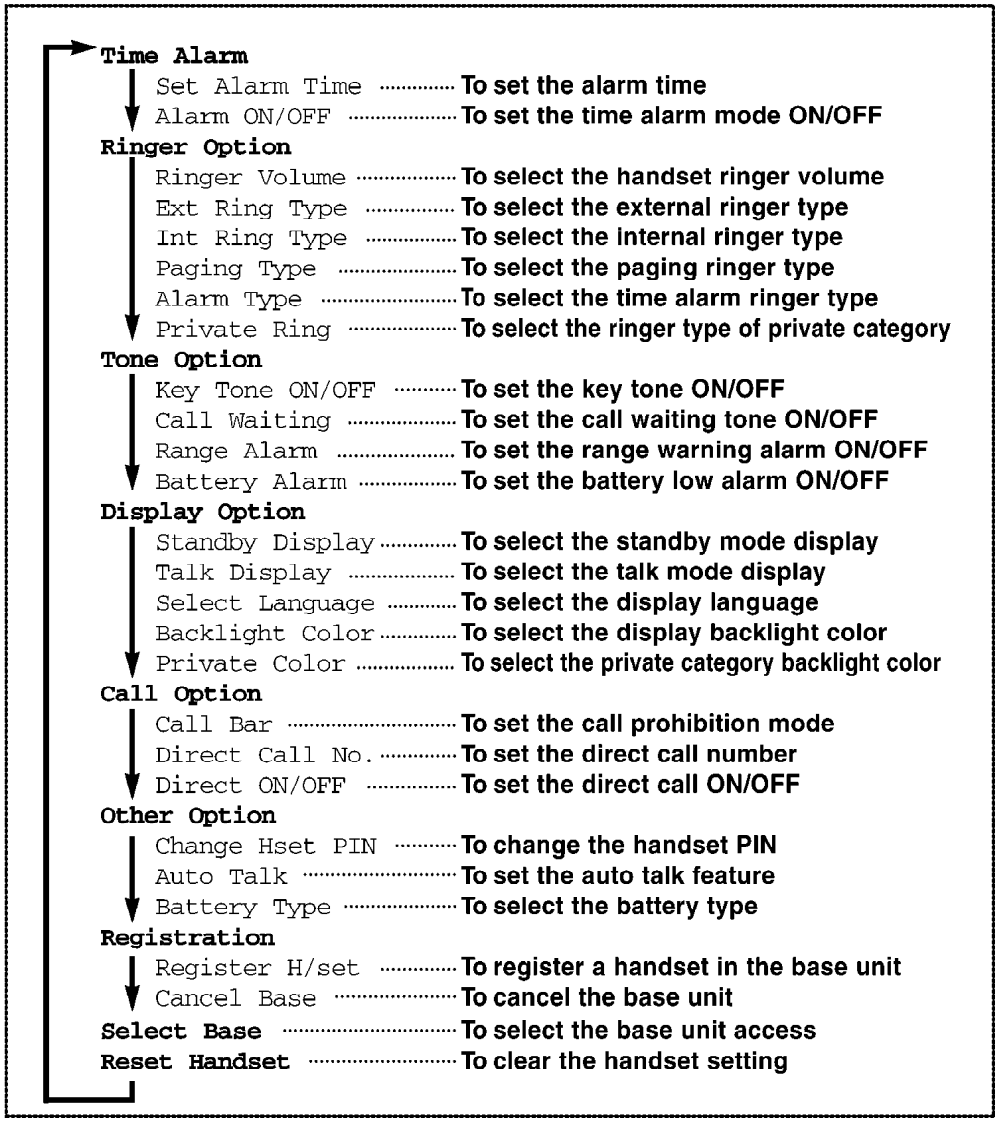


While programming:

*To select a desired function item, press ▼ or ▲ until the arrow points to the item. Then press ▶ to go to the next step.

- You can press ☰ to go to the next menu of the function menu instead of pressing ▶.
- To return to the previous step during programming, press ◀ or C.
- You can exit the programming mode any time by pressing .
- When programming is completed, a beep sounds.

Handset settings menu


Time Alarm
Set Alarm Time ..... To set the alarm time
Alarm ON/OFF ..... To set the time alarm mode ON/OFF
Ringer Option
Ringer Volume ..... To select the handset ringer volume
Ext Ring Type ..... To select the external ringer type
Int Ring Type ..... To select the internal ringer type
Paging Type ..... To select the paging ringer type
Alarm Type ..... To select the time alarm ringer type
Private Ring ..... To select the ringer type of private category
Tone Option
Key Tone ON/OFF ..... To set the key tone ON/OFF
Call Waiting ..... To set the call waiting tone ON/OFF
Range Alarm ..... To set the range warning alarm ON/OFF
Battery Alarm ..... To set the battery low alarm ON/OFF
Display Option
Standby Display ..... To select the standby mode display
Talk Display ..... To select the talk mode display
Select Language ..... To select the display language
Backlight Color ..... To select the display backlight color
Private Color ..... To select the private category backlight color
Call Option
Call Bar ..... To set the call prohibition mode
Direct Call No. ..... To set the direct call number
Direct ON/OFF ..... To set the direct call ON/OFF
Other Option
Change Hset PIN ..... To change the handset PIN
Auto Talk ..... To set the auto talk feature
Battery Type ..... To select the battery type
Registration
Register H/set ..... To register a handset in the base unit
Cancel Base ..... To cancel the base unit
Select Base ..... To select the base unit access
Reset Handset ..... To clear the handset setting

5.5. Programmable Settings

Selecting the Display Language

You can choose one of 18 display languages. The factory preset is German.
Make sure that the power is ON and the unit is in the standby mode.

1 **Press** ☰.

2 **Press** ▼ **or** ▲ **until the arrow points to** "Setting Handset", **then press** ▶.

3 **Press** ▼ **or** ▲ **until the arrow points to** "Display Option", **then press** ▶.

4 **Press** ▼ **or** ▲ **until the arrow points to** "Select Language", **then press** ▶.

- The current setting is at the arrow.

5 **Press** ▼ **or** ▲ **to select the desired language.**

6 **Press** ☰.

- A beep sounds.
- The display shows in the selected language.
- To return to the standby mode, press ⏻.

Setting the Date and Time

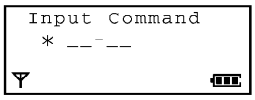
After setting the date and time, the current date and time will be displayed on the handset in the standby mode. You can set 24-hour clock by programming.
Make sure that the power is ON and the unit is in the standby mode.

Setting time

1 **Press** (MENU).

2 **Press** (▼) **or** (▲) **until the arrow points to "Setting Base", then press** (▶).
- "Input Command" is displayed.

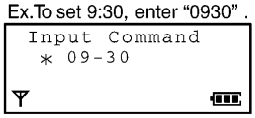
3 **Press** (✱).



- If already set, the current setting is displayed.

4 **Enter the current time (24 hour time) using a 4–digit number.**

Ex.To set 9:30, enter "0930".



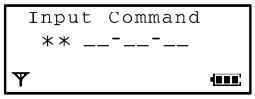
5 **Press** (MENU).
- A beep sounds.
- To return to the standby mode, press (C).

Setting date

1 **Press** (MENU).

2 **Press** (▼) **or** (▲) **until the arrow points to "Setting Base", then press** (▶).
- "Input Command" is displayed.

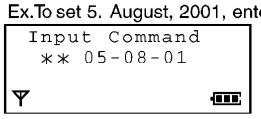
3 **Press** (✱) **TWICE.**



- If already set, the current setting is displayed.

4 **Enter the current date (day, month, year) using a 6-digit number.**

Ex.To set 5. August, 2001, enter "010801".



5 **Press** (MENU).
- A beep sounds.
- To return to the standby mode, press (C).

If a power failure occurs, the adjusted day/time will be erased. Readjust the date and time.

Selecting the Auto Talk Feature

The Auto Talk feature allows you to answer a call by lifting the handset off the base unit without pressing [ ] or [ ]. In order to view Caller ID information before answering a call, leave the auto talk feature OFF. If you want to use this feature, turn the feature ON by programming.
The factory preset is OFF
Make sure that the power is ON and the unit is in the standby mode.

1 **Press [MENU].**

2 **Press[▼] or [▲] until the arrow points to "Setting Handset", then press [▶].**

3 **Press[▼] or [▲] until the arrow points to "Other Option", then press [▶].**

4 **Press[▼] or [▲] until the arrow points to "Auto Talk", then press [▶].**
- The current setting is at the arrow

5 **Press [▼] or [▲] to select "ON" or "OFF".**

6 **Press [MENU].**
- A beep sounds.
- To return to the standby mode, press [ ].

Selecting the Handset Ringer Volume

6 levels are available. The lowest level is 1. The highest level is 6. The factory preset is 3. When set to OFF, the handset will not ring.

Press [MENU] ➡ [▼] or [▲] to select "Setting Handset" then [▶] ➡ [▼] or [▲] to select "Ringer Option" then [▶] ➡ [▼] or [▲] to select "Ringer Volume" then [▶] ➡ ➡ [▲] or [▼] to select the desired level ➡ [MENU] ➡ [ ]

- To turn the ringer OFF, erase " " by pressing [▼] until "OFF" is displayed.

Selecting the Base Unit Ringer Volume

4 levels (HIGH, MEDIUM, LOW, OFF) are available. The factory preset is MEDIUM. When set to [0] (OFF), the base unit will not ring.

Press[MENU] ➡ [▼] or [▲] to select "Setting Base" then [▶] ➡ [2] ➡ [2] ➡ ➡ Volume level (0–3) ➡ [MENU] ➡ [ ]

6. CIRCUIT OPERATION (BASE UNIT)

BLOCK DIAGRAM BASEBAND SECTION AND LINE INTERFACE (BASE UNIT)

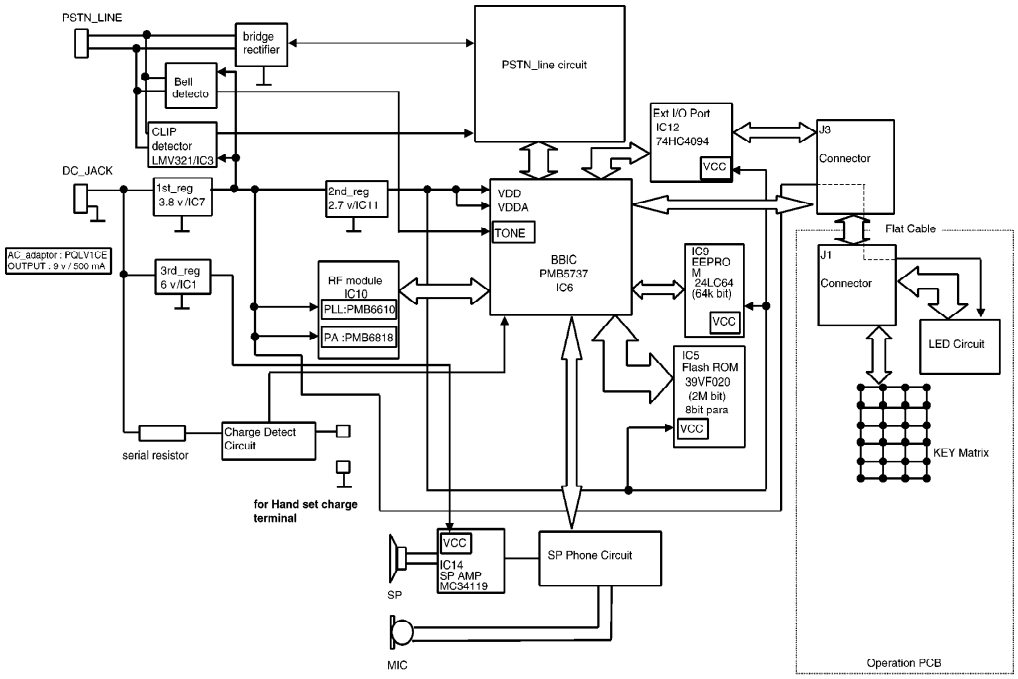


Fig. 17

6.1. THE BASE-BAND SECTION

6.1.1. INTRODUCTION (SEE Fig. 17)

The base-band section consists of a base-band integrated circuit (BBIC), a Flash PROM and an EEPROM.

6.1.2. THE BASE-BAND INTEGRATED CIRCUIT (BBIC)

The CICB00001367 (PMB5737 : IC6) is a CMOS device designed to handle all the audio, signal and data processing needed in a DECT base unit. It contains a "burst mode controller" which takes care of DECT specific physical layer and radio section control. It also contains an ADPCM codec filter used for speech encoding and decoding in the DSP section, a general purpose microcontroller, various other ADC's, DAC's, timers and power control circuitry.
The BBIC interfaces to its external PROM (IC5) via a data/address/control bus. It connects to the EEPROM (IC9) via a serial interface, and a second serial interface is used during manufacture and service to connect to an external computer.

6.1.3. FLASH PROM (SEE Fig. 18)

The 2 Mbit (IC5) Flash PROM contains the operational firmware for the microcontroller. It is interfaced to the data/address/control bus using address lines A0 to A17, data lines D0 to D7, and chip select (pin 30), output enable (pin 32), and write (pin 7).

6.1.4. EEPROM (SEE Fig. 18)

The electrically erasable PROM PQVIT2464WM6 (IC9) is used to store all the temporary operating parameters for the base (see EEPROM LAYOUT (BASE UNIT)). It uses a two-line serial data interface with the BBIC, with bi-directional data on pin 5 (TP104), and clock on pin 6 (TP3).

6.1.5. CLOCK GENERATION (SEE Fig. 18)

A single clock generator in the BBIC uses an external crystal X1 to derive all clock frequencies used in the base. The crystal is tuned to the exact frequency of 10.368 MHz during manufacture. The BBIC provides a reference clock signal SYRI (pin 5, TP101) which is used to drive the PLL circuitry in the RF module. The basic data rate for TXDA (pin 12 and RXDA (pin 20) is 1.152 Mbits /s, which is 10.368MHz divided by 9.

6.1.6. FACTORY SERIAL PORT (SEE Fig. 18)

In order to communicate with the base band section during manufacture and servicing (using a PC) a serial data link has been provided.
Serial data input/output is provided through the SDA terminal (J102). The data is clocked through using the SCL terminal (J103). A ground terminal is provided by J104.
The serial port terminals J100 to J104 are connected to by means of test probe pads on the ground plane side of the pcb.

6.1.7. AUDIO PATH-RX AUDIO-LINE INPUT (SEE Fig. 18)

Audio from the line interface TXAF (TP97) enters the BBIC on pin 134. The audio signal passes through the analogue part of the BBIC where it is amplified and converted to a digital audio stream signal. The burst mode controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP standard DECT frame, assigning to a time slot and channel etc. to emerge on pin 12 as TXDA.

6.1.8. AUDIO PATH - TX AUDIO - LINE OUTPUT (SEE Fig. 18)

Audio from the receiver RXDA enters the BBIC on pin 20 as GAP standard DECT frames. It passes through the decoding section burst mode controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP where it is turned back into analogue audio. This is amplified by the analogue front end and emerges at pin 126 - i.e. the RXAF signal of the line interface.

Circuit Diagram

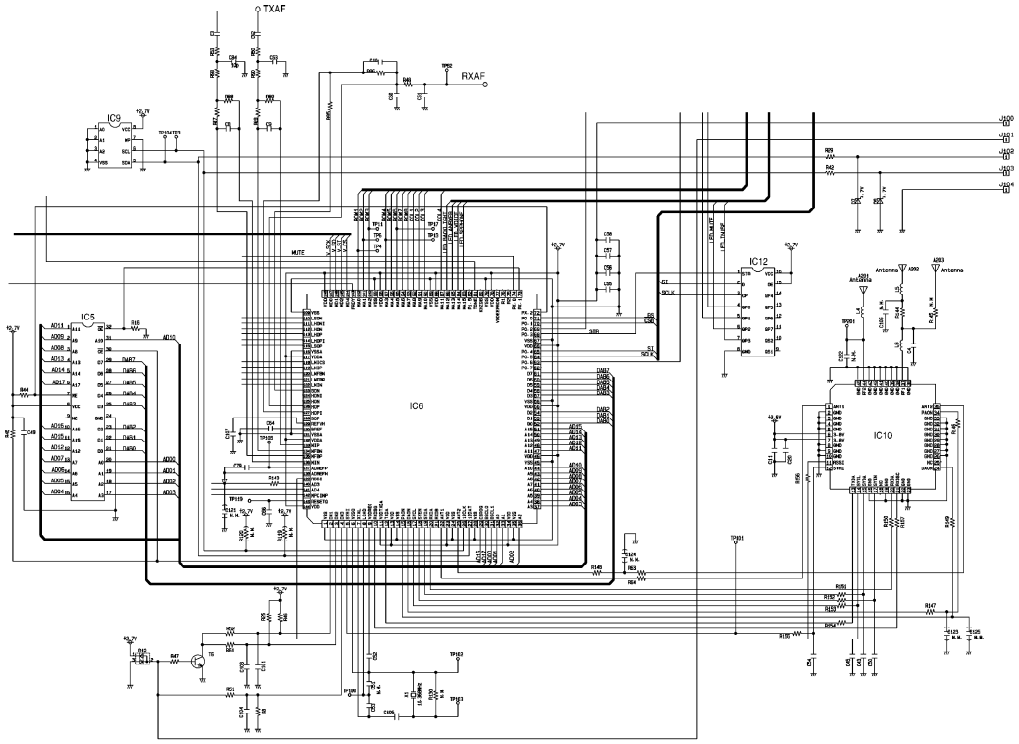


Fig. 18

6.2. THE LINE INTERFACE SECTION (SEE BLOCK DIAGRAM Fig. 17)

6.2.1. INTRODUCTION

This section consists of the telephone line interface, bell detector, charge-pulse detector, hook switch, pulse dialing circuits, audio circuits, DC mask & line impedance circuits, power supplies, and battery charger circuits.

6.2.2. TELEPHONE LINE INTERFACE (SEE Fig. 19)

The telephone line is connected to a bridge rectifier D8. Surge suppressor SA3 protects against excessive line voltages. Test points are TP40 (A), TP26 (B). Bridge rectifier D8 provides for lines of either polarity. The output of D8 is “Line +” (TP50) and “Line -” which is ground.

6.2.3. BELL DETECTOR (SEE Fig. 19)

The AC ringing signal is detected by phoptocoupler IC2, using its internal diode in conjunction with D4. DC from the line is blocked by C2. The other components D2, D3, and R3 reduce current and increase the circuit impedance in line with national requirements. When ringing is detected IC2 will turn on, and the RING line will be dragged to a low voltage.

6.2.4. CLIP CIRCUITS (SEE Fig. 19)

The CLIP signal is detected by IC3 and sent to the BBIC through the /TXAF line as a square waveform. The CLIP_STATE signal from the BBIC is used to provide a CLIP impedance through

a combination of components selected from R85, R86, C93, C37 and R1. The combination depends upon the CLIP requirements of the specific country - often there is no requirements for the CLIP_STATE impedance.
T10 disables the CLIP signal during the off-hook condition.

6.2.5. HOOKSWITCH (SEE Fig. 19)

T8 is the hookswitch, driven by T9. When the phone is “off-hook”, the HOOK control signal from the BBIC will be a high logic level (+2.7V), and both transistors will be on, thus T8 will “loop” the line. The zenner diode D10 protects transistors T11 to T13 against transient line voltages.

6.2.6. AUDIO CIRCUITS (SEE Fig. 19)

The loop current (typically 40mA) passes through T13, R57 and R56. R54 and R55 provide dc biasing for the base of T13.
The line output signal from the BBIC RXAF is DC decoupled by C47 and amplified by T13. The emitter load (R57, R58 and C46) is complex in order to achieve the right frequency response with the complex line impedance.
The line input signal TXAF is taken from the junction of R41 and R49. Phase cancellation is provided at this point by R70 so that only the incoming line audio should be passed to the BBIC on TXAF.

Circuit Diagram

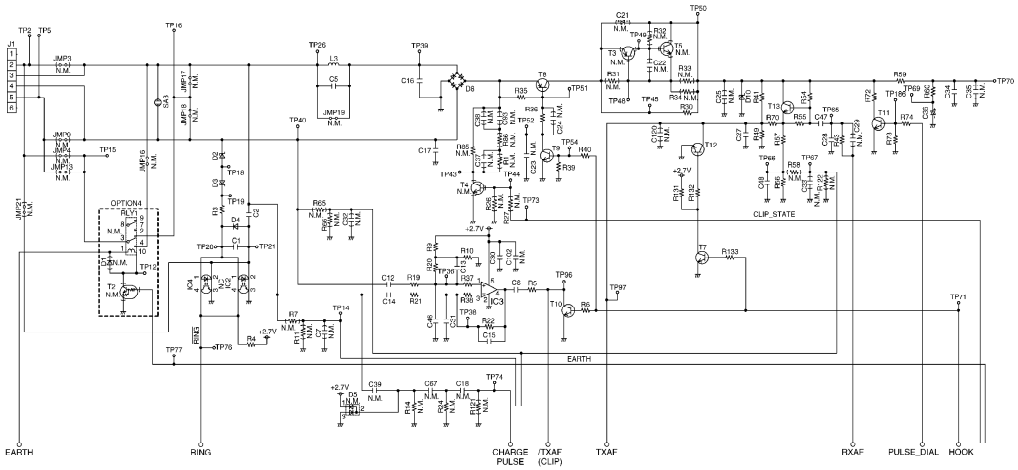


Fig. 19

6.2.7. POWER SUPPLIES (SEE Fig. 20)

The AC adaptor for the KX-TCD715 provides unregulated DC through J2 for the handset charge terminal, 6V regulator (IC1) the 3.8V regulator (IC7) and the Relay coil (RL1) where fitted.
The 3.8V supply from IC7 is used for the RF module, and is further reduced by IC11 to 2.7V for the BBIC supply.
The 6V supply from IC1 is used for SP-Phone AMP. (IC14).
R17, 18 and 28 provide short circuit/over current protection at the handset charge terminal.
R109, D6, T1, R110, R111, R112 and D11 are charge detection circuit, in order to detect whether put Handset on cradle or not.

Circuit Diagram

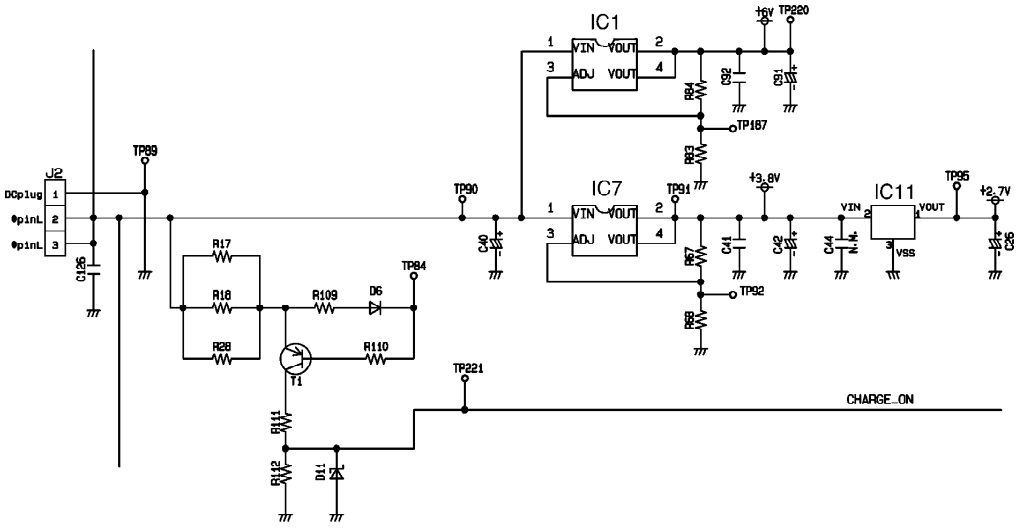


Fig. 20

6.3. Speakerphone (SEE Fig. 21)

The extra circuitry for the TCD715 speakerphone circuit comprises a microphone, a speaker, and a speaker amplifier IC14. However, note that the majority of the speakerphone functionality is contained within the existing BBIC IC6. This includes the switching between microphone and speaker path, echo suppression and cancelling, etc.
Around circuit of T14 is filter in order to reduce sampling noise.
The DC supply to the speakerphone amplifier IC14 pin 6, is a 6V supply, derived from the regulator IC1 (TP220).

Circuit Diagram

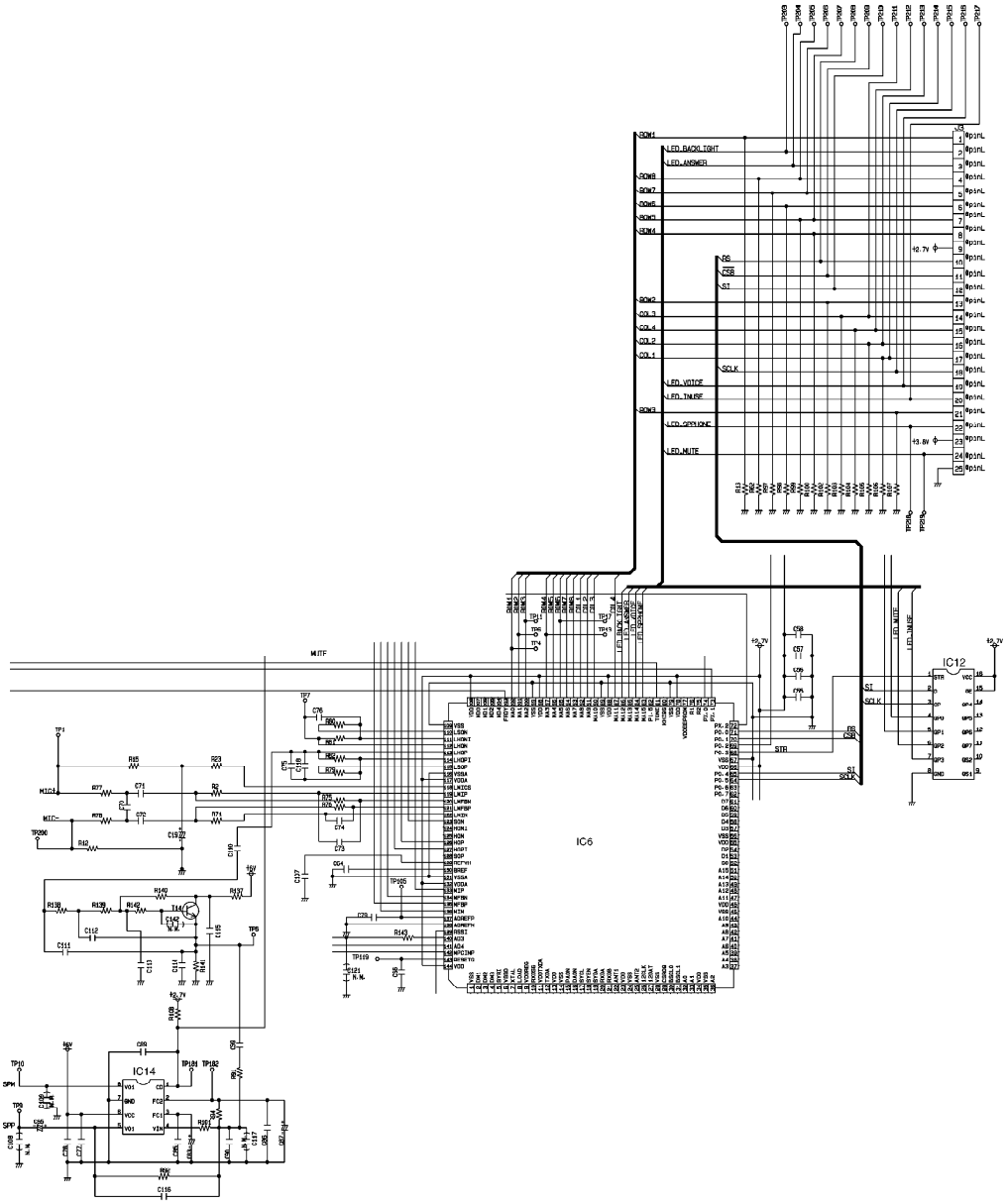


Fig. 21

6.3.1. Path from Telephone Line to Speaker

Audio from the telephone line passes via the normal signal path of J1 tel-line connector (TP26 and TP40), D8 bridge rectifier, T8 hookswitch (TP50), and R41, to BBIC IC6 pin 133. In the BBIC it is converted from an analogue audio signal into digital data in the BBIC's internal codec. Additionally, the speakerphone switching and echo suppression functions are contained within the BBIC. An eight level speaker volume control is provided, and the functionality for this is also contained within the BBIC. The analog data is sent from the BBIC IC6 pin 113 to the speaker amplifier IC14 pin 4, via filter circuit (T14). The audio signal is amplified in IC14, and the push-pull audio output is sent from IC14 pins 5 and 8 to the speaker (TP9) and (TP10).

6.3.2. Path from Microphone to Telephone Line

DC bias for the microphone is provided from the BBIC IC6 pin 118 (positive bias) and GND (negative bias). The bias is fed to the microphone via R15 and R23 (positive bias) and R12 (negative bias). The balanced audio signal from the microphone is fed to the BBIC (IC6), via R77,

C71 and R2 (Positive), R78, C72 and R71 (negative).
The analogue signal is converted into a digital signal in the BBIC IC6 pin 119 and 122. The speakerphone switching and echo suppression functions are contained within the BBIC. The digital data is converted again into an analogue signal in the BBIC's internal codec.
The analogue signal is fed from IC6 pin126, via T13 audio amplifier, T8 hookswitch (TP50), D8 bridge rectifier, to J1 tel. line connector (TP26 and TP40), and out to the telephone line.

6.4. Keyboard

The TCD715 is fitted with a keyboard which provides the user with comprehensive speakerphone facilities, and includes a full numeric keypad for dialling out.The keyboard is mounted on a separate pcb, and is connected to the main pcb via J3 connector.
Keyboard scan pulses and LED drive signals are fed from the BBIC address/data bus to the keyboard via and connector J3.Key press information from the keyboard is fed via J3 to the BBIC address/data bus.

6.5. RF MODULE

BLOCK DIAGRAM RF MODULE

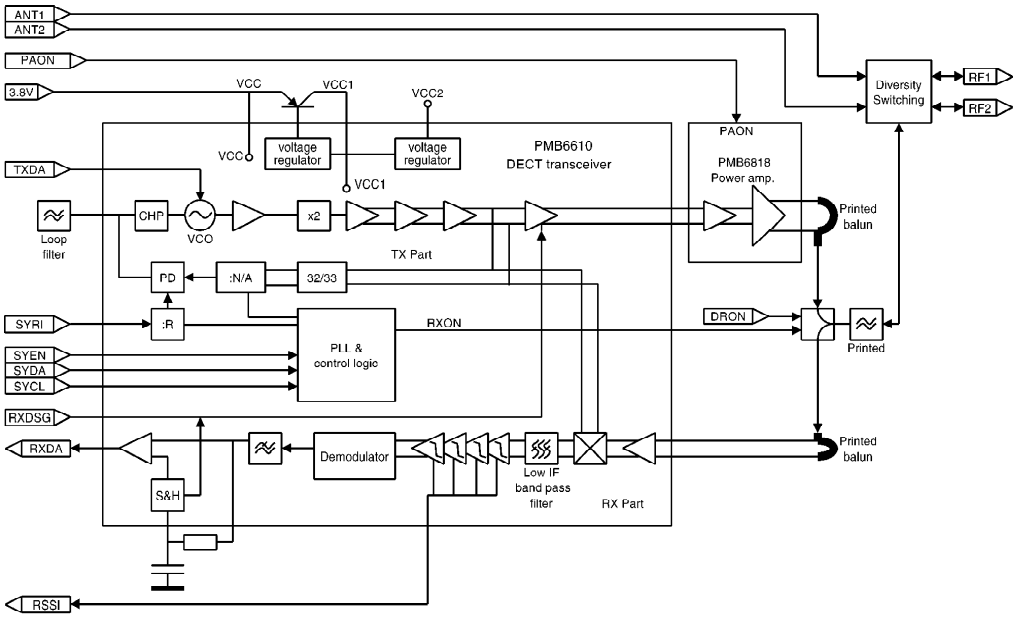


Fig. 22

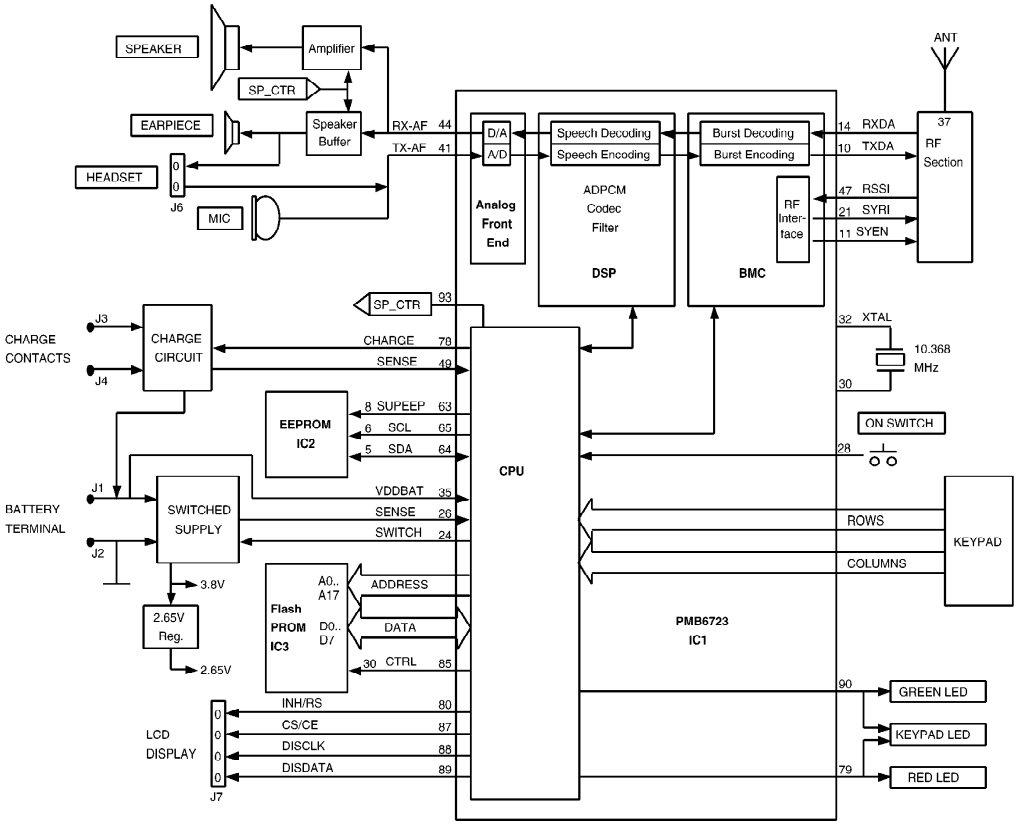
6.5.1. RF MODULE (SEE BLOCK DIAGRAM Fig.22)

The RF Module consists of two main components: the PMB6610 transceiver and the PMB6818 power amp.
In the transceiver the 10.368MHz clock signal SYCL is multiplied to around 1.9GHz using PLL (Phase Locked Loop) control.
The TXDA signal is used to control the modulation of this frequency to 1.87GHz to 1.93GHz. Received signals are demodulated, filtered and sent to the BBIC via the RXDA line.
The RSSI (Radio Signal Strength Indicator) signal enables the implementation of diversity switching whereby two antennae can be mounted in different orientations and their signals compared. The one with better reception can be selected by the BBIC using the ANT1 and ANT2

lines.

7. CIRCUIT OPERATION (HANDSET)

BLOCK DIAGRAM BASEBAND SECTION (HANDSET)



7.1. THE BASE BAND SECTION

7.1.1. INTRODUCTION

The base-band section consists of a base-band integrated circuit (BBIC), a Flash PROM, an EEPROM, an LCD Display, a Microphone, an Earpiece, and power supply/battery management circuits.

7.1.2. THE BASE-BAND INTEGRATED CIRCUIT (BBIC)

The PMB6723 (IC1) is a CMOS device designed to handle all the audio, signal and data processing needed in a DECT handset. It contains a "burst mode controller" which takes care of DECT specific physical layer and radio section control. It also contains an ADPCM codec filter used for speech encoding and decoding in the DSP section, a general purpose microcontroller, various other ADC's, DAC's, timers and power control circuitry.
The BBIC interfaces to its external PROM (IC3) via a data/address/control bus. It connects to the EEPROM (IC2) via a serial interface (SDA and SDC). This serial interface is also used during

manufacture and service to connect to an external computer.

7.1.3. FLASH ROM (SEE Fig. 24)

The 1Mbit Flash PROM IC3 contains the operational firmware for the BBIC's general purpose microprocessor. It is interfaced to the BBIC using address lines A0 to A17, data lines D0 to D7, and control lines CE (Chip Enable), WE (Write Enable) and OE (Output Enable).

7.1.4. EEPROM (SEE Fig. 24)

The electrically erasable PROM IC2 is used to store all the temporary operating parameters for the handset (see EEPROM LAYOUT). It uses a two-line serial data interface with the BBIC, with bi -directional data on IC2 pin5 (TP52), and a 45 kHz clock on pin6 (TP53).

7.1.5. FACTORY SERIAL PORT (SEE Fig. 24)

In order to communicate with the handset during manufacture and servicing (using a PC) a serial data link has been provided.
Serial data input/output is provided through the I2DAT input (pin 64). The data is clocked through using the I2CLK pin (65). Test probe pads SDA and SDC are provided for Flash PROM download with I2DAT and I2CLK respectively.
To invoke the flash PROM download mode the MODE_SEL test pad must be connected to the 2.65V pad.
A Ground reference Test pad is also provided.

Circuit Diagram

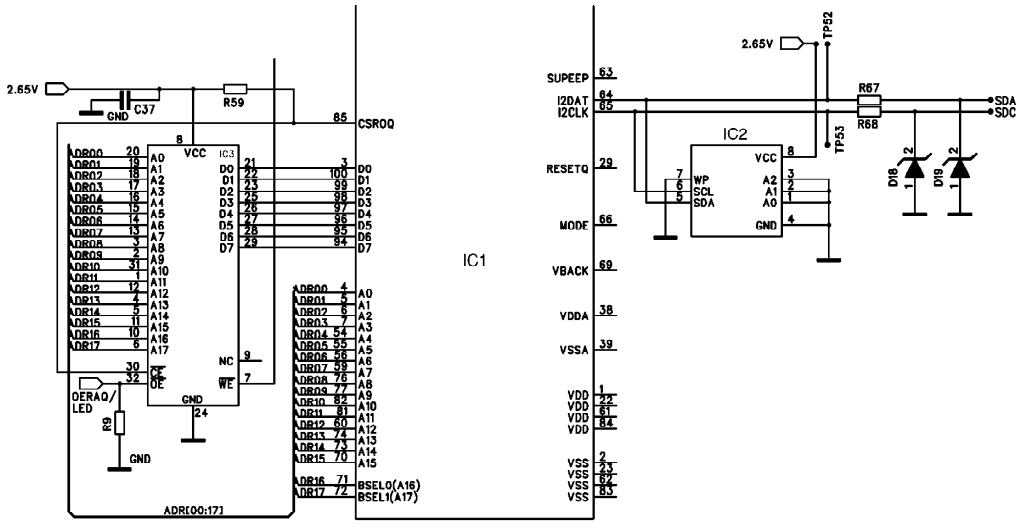


Fig. 24

7.1.6. AUDIO PATH - TX AUDIO (SEE Fig. 25)

The audio signal from the microphone (TP23) enters the BBIC at pin 44. RF decoupling and

signal conditioning are provided by C17, R21, C14 and C25.
In the BBIC the signal passes through the analogue section where it is amplified and converted to a digital audio stream signal. The burst mode controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP standard DECT frame, assigning to a time slot and channel etc. to emerge on pin 14 as TXDA.

7.1.7. AUDIO PATH - RX AUDIO (SEE Fig. 25)

Audio from the receiver RXDA enters the BBIC on pin 10 as GAP standard DECT frames. It passes through the decoding section burst mode controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP where it is turned back into analogue audio. This is amplified by the analogue front end and emerges at pin 40 and 41. The telephone speaker is driven directly from the BBIC output ports. The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm. When the handset is not in hands-free mode the HF_AM1 amplifier is deactivated by the SP_CTR control signal at pin 93 from the BBIC.
The earpiece speaker LS1 is driven directly from the HON and HOP output lines, pins 40 and 41, without any amplification.
A 2.5mm jack J6 is provided for connecting a headset.

7.1.8. CLOCK GENERATION (SEE Fig. 25)

A single clock generator in the BBIC uses an external crystal X1 to derive all clock frequencies used in the handset. The crystal is tuned to the exact frequency of 10.368 MHz during manufacture.
The BBIC provides a reference clock signal SYRI (pin 21, TP101) which is used to drive the PLL circuitry in the RF module. The basic data rate for TXDA (pin 14) and RXDA (pin 10) is 1.152 Mbits/s, which is 10.368MHz divided by 9.

Circuit Diagram

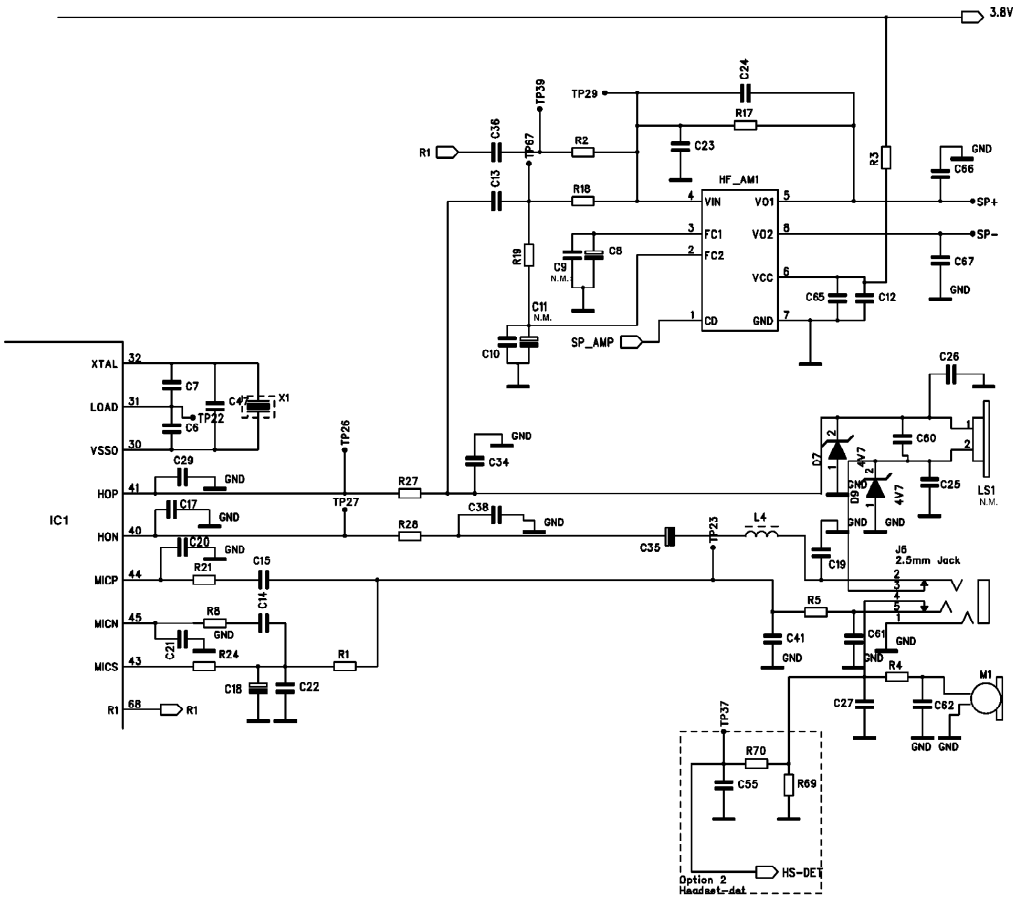


Fig. 25

7.1.9. KEYBOARD (SEE Fig. 26)

The keyboard “On” button is connected directly to pin 33 and 28 of the BBIC. When pressed it turns the handset on and off. All other keys are connected in a row/column matrix. They are scanned in five rows using scan pulses (only active when keys are pressed) from IC1 pins 15 to 19. The five key matrix columns are input to the BBIC on pins 51, 52, 53, 57 and 58.

7.1.10. LCD DISPLAY, AND DISPLAY DRIVER (SEE Fig. 26)

The LCD display receives data via a serial interface. Serial data is sent to the display on pin 6 of the J5 socket, with control lines at pin3 thru 6.

Circuit Diagram

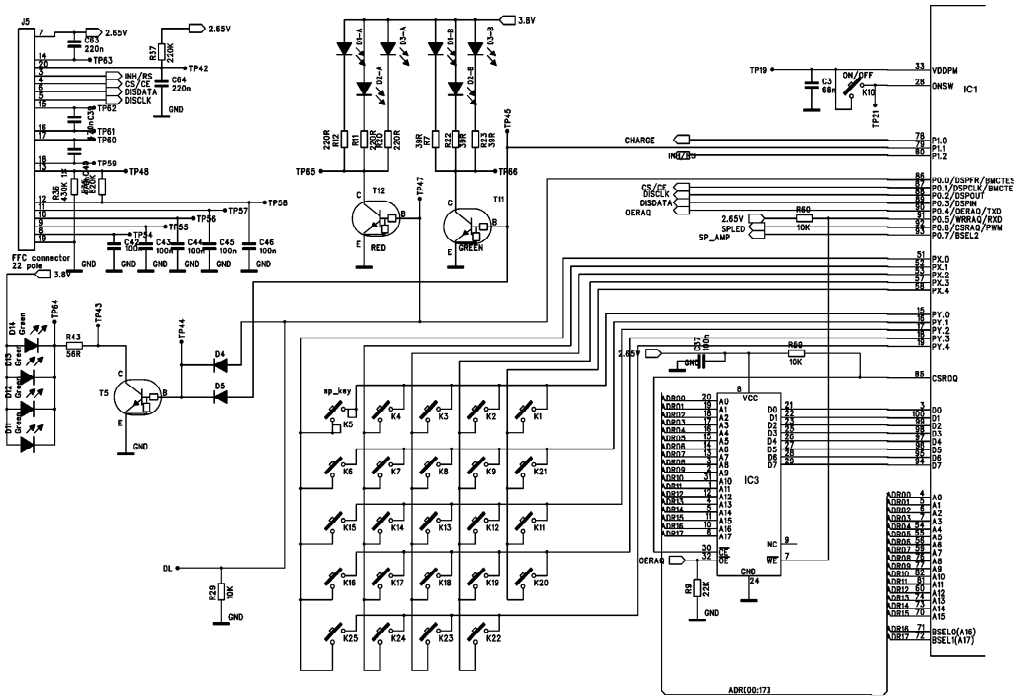


Fig. 26

7.1.11. BATTERY SUPPLY (SEE Fig. 27)

A switch mode boost converter is used to provide a 3.8V supply from the battery. This supply is sensed by the BBIC through pin 26 (TP14) so that the switching rate can be controlled by a FET (T3) driven from pin 24 (TP13). A resistor on the Source of the FET provides a current sense at pin 25 (TP12).
T3 switches the current through L1. When T3 switches off the back emf conducts through D16 and charges the reservoir cap C4.

7.1.12. 2.65V REGULATOR (SEE Fig. 27)

A 2.65V supply is provided for the BBIC and is regulated by the BBIC's on board control signal LRB (pin 37).
This reference is fed to the base of T6 to keep the "VREG+" line at 2.65V.

7.1.13. BATTERY CHARGING CIRCUIT (SEE Fig. 27)

The supply for the battery comes from the charge terminals at J3 and J4. Battery charge rate is controlled by switching the current through T7 such that the average charging current is 170mA. The current flow is monitored at pin 49 of the BBIC by measuring the voltage across R56.
D21 protects against the high voltage present on the charge contacts (J3 and J4) when there is no battery in the handset. R42 and C50 provide a signal to the BBIC (pin 27) to detect that the handset has been placed on the base charger.

Circuit Diagram

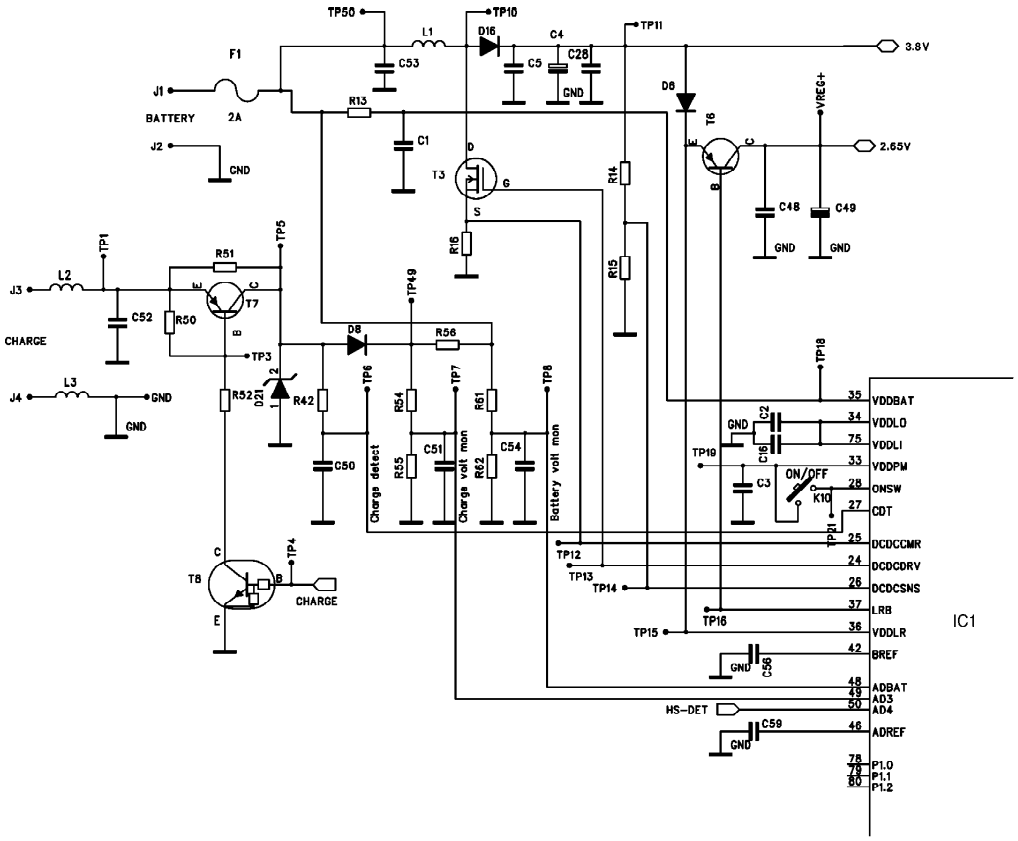


Fig. 27

7.2. RF SECTION

7.2.1. BLOCK DIAGRAM RF SECTION (HANDSET)

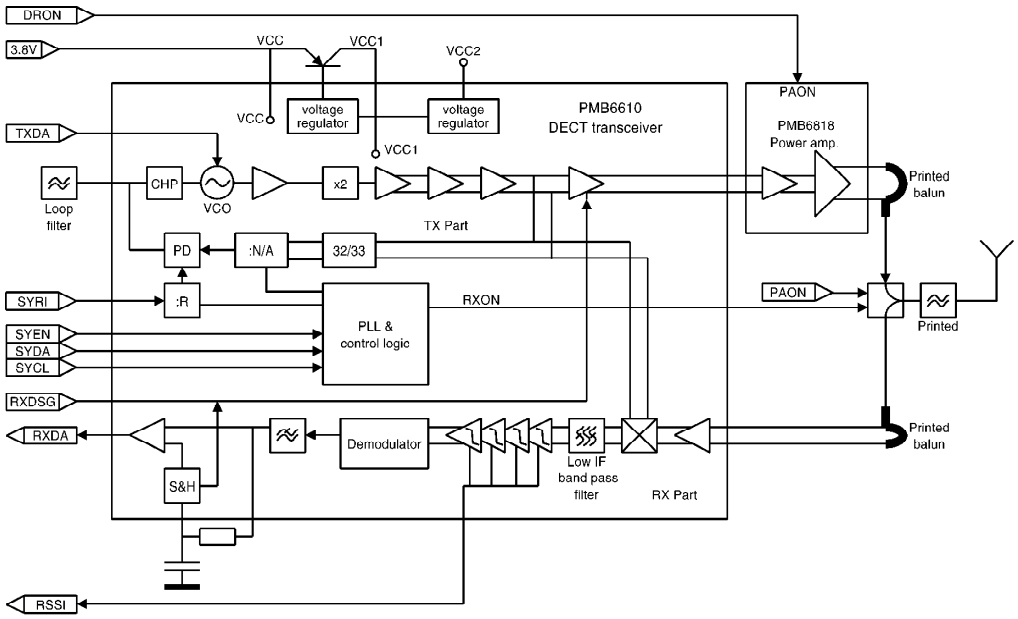


Fig. 28

The RF section consists of two main components: The PMB6610 transceiver and the PMB6618 power amp.
In the transceiver the 10.368MHz clock signal SYCL is multiplied to around 1.9GHz using PLL (Phase Locked Loop) control. The TXDA signal is used to control the modulation of this frequency to 1.87GHz to 1.93GHz.
Received signals are demodulated, filtered and sent to the BBIC via the RXDA line.

8. CHECK PROCEDURE (BASE UNIT)

8.1. EQUIPMENT REQUIRED

- CMD60

TEST MODE:	FP		
CONFIG MENU:	SIGN	SCRAMBLE:	OFF
MANUAL TEST:	TRAFFIC SLOT: 4		
	TRAFFIC CARRIER: 5		
	RF LEVEL: -55dBm		

- Bell oscillator: 30V RMS, 23Hz
- Regulated power supply (bench supply): 9V, 1A
- DMM
- Ammeter
- Frequency counter
- Oscilloscope
- PC running in DOS mode. Type "SET RTX_LPT=1" to select LPT1 comms port
- EEPROM parallel communications adapter.
- Test software and Batch files for base unit:
  CONTTX.BAT, DEACTMAC.BAT, HOOKOFF.BAT, HOOKON.BAT, I2CMAIL.EXE, LINEIMP.BAT, RDEEPROM.BAT, RINGDET.BAT, SETFREQ.BAT, TESTMODE.BAT, DTMF_UP.BAT, DTMF_LO.BAT, ANT2.BAT
- Line/DTMF test set

Connect the 9V supply to the pcb at J2: pin 1 to -V and pin 2 to +V.
Connect the communications wires from the PC to test pads J104 (0V), J103 (CLK) and J102 (DATA).
Make sure that the current DOS directory contains the batch files listed above.

8.2. INITIAL POWER TESTS

1. Turn on the 9V supply.

2. Check for approx. 90mA current on the 9V supply line.

3. Check the 3.8V supply rail at TP91. It must be 3.8V ± 0.2V.

4. Check the 2.7V supply rail at TP95. It must be 2.7V ± 0.2V.

5. Check the 6.0V supply rail at TP220. It must be 6.4V ± 0.3V.

8.3. SET THE CLOCK FREQUENCY

1. Turn on the 9V supply.

2. Enter "DEACTMAC" from the PC to switch off the RF unit.

3. Enter "CONTTX 0" to start continuous RF transmission.

4. "Enter "RDEEPROM 00 00 02" to display the clock frequency

adjustment value.".

5. Connect the frequency counter probe to TP101, or pin12 of the RF module, to measure the SYRI signal from the BBIC.
6. The clock frequency should be within 10,368,000Hz ± 10Hz. If not then enter "SETFREQ nn nn" where nn nn are the clock frequency adjustment values. An increase in the value will lower the clock frequency and vice versa. The maximum value is 00 FF.
7. Switch off the 9V supply.

8.4. LOOPBACK TESTS

1. Connect the RF Cable from the CMD60 to the RF 2 line (IC10 pin44) and Ground plane of the base P.C.B. Use the minimum amount of stripped/exposed cable to solder to the contacts.
2. Switch on the 9V supply.
3. Set the CMD60 to MANUAL TEST mode.
4. Set the CMD60 TRAFFIC CARRIER to 0.
5. Invoke the "TESTMODE" batch file from the PC.
6. Press ACCEPT RFPI and SETUP CONNECT on the CMD60.
7. If connection is successful the CMD60 will display "CONNECTION ESTABLISHED"
8. Enter "ANT2" to direct the RF output to the "RF 1" terminal
9. Check the power (NTP): it must be between 20 and 25dBm.
10. Press MODULATION.
11. Set DATA TYPE to FIG 31.
12. Check frequency drift: must be 0 ± 35 kHz/ms.
13. Check frequency offset: must be 0 ± 40 kHz.
14. Check deviation or modulation (max ± B field) with data type "FIG 31": must be 340kHz to 380kHz.
15. Press Menu Up " ↑ " on the CMD60.
16. Press POWER RAMP.
17. Check that the burst fits the mask.

18. Press Menu Up " ↑ " on the CMD60.
19. Press BER.
20. Obtain the sensitivity by slowly reducing RF LEVEL until the BER falls below 1000ppm. The sensitivity is the RF LEVEL reading at this point. It must be < -88dBm.
21. Press Menu Up " ↑ " on the CMD60.
22. Press BEARER RELEASE and switch off the 9V supply.
23. Disconnect the RF cable from the PCB.

Note:

These tests can also be repeated on TRAFFIC CARRIERS 5 and 9.

8.5. TELEPHONE LINE TESTS

1. Switch on the 9V power supply.
2. Connect a telephone cord from the base unit to the line/DTMF test set.
3. Enter "HOOKOFF" from the PC to invoke an off-hook condition.
4. Set the current limit to 40mA on the line simulator.
5. Enter "HOOKON" from the PC to invoke the on-hook condition.
6. Check that the line current has dropped to 0 ± 0.5mA.
7. Enter "HOOKOFF".
8. Use a DMM to test the off-hook voltage at TP50. It must be 6.5V ± 1.0V.
9. Enter "DTMF_UP" to make the base generate the upper DTMF frequency.
10. Check that the upper frequency is detected by the line/DTMF test set. Must be 1477Hz ± 1.5%.
11. Enter "DTMF_LO" to make the base generate the lower DTMF frequency.
12. Check that the lower frequency is detected by the line/DTMF test set. Must be 852Hz ± 1.5%.
13. Switch off the 9V power supply.
14. Disconnect the telephone line and reconnect the base to the Bell

oscillator.

15. Switch on the 9V supply.
16. Enter "RINGDET" to check the ring detection status. The command returns a number to the PC display. "0" = no ring.
17. Switch the bell oscillator on to 23Hz, 30V RMS.
18. Send the batch file "RINGDET".
19. Check that the Number on the PC display has changed to "1".
20. Switch off the 9V power supply.

8.6. CHARGE CURRENT TESTS

1. Switch on the 9V power supply.
2. Connect an ammeter directly across the charge terminals (effectively short circuiting them).
3. Measure 250mA ± 15% through the meter.
4. Switch off the 9V power supply.

9. CHECK PROCEDURE (HANDSET)

9.1. EQUIPMENT REQUIRED

- CMD60
  TEST MODE: PP
  CONFIG MENU: SIGN SCRAMBLE: OFF
  MANUAL TEST: TRAFIC SLOT: 4
  TRAFFIC CARRIER: 5
  RF LEVEL: -55Dbm

- Regulated power supply (bench supply): 2.4V, 1A
- DMM
- Ammeter
- Frequency counter
- PC running in DOS mode. Type "SET RTX_LPT=1" to select LPT1 comms port
- EEPROM parallel communications adapter.
- Test software and Batch files for handset:
  CONTTX.BAT, DEACTMAC.BAT, I2CMAIL.EXE, RDEEPROM.BAT, WREEPROM.BAT, SETFREQ.BAT, TESTMODE.BAT, SETBASE.BAT, RESBASE.BAT

Connect the 2.4V supply to the pcb at J1 (+V) and J2 (0V).
Connect the communications wires from the PC to GND, SDA and SDC test pads.
Make sure that the current DOS directory contains the batch files listed above.

9.2. INITIAL POWER TESTS

1. Switch on the 2.4V supply.
2. Switch the handset on at the keypad.
3. Check for approx. 120mA current on the supply line for around 10s.

4. Check the 3.8V supply rail at TP11. It must be 3.8V ± 0.2V.
5. Check the 2.65V supply rail at the collector of transistor T6. It must be 2.65V ± 0.2V.
6. Switch off the 2.4V supply.

9.3. SET CLOCK FREQUENCY

1. Turn on the 2.4V supply.
2. Switch the handset on at the keypad.
3. Enter "DEACTMAC" from the PC to switch off the RF unit.
4. Enter "CONTTX 0" to start continuous RF transmission.
5. Check that the current consumption is approx. 220mA.
6. Enter "RDEEPROM 00 00 02" to display the two-byte frequency adjustment value, MSB first.
7. Connect the frequency counter probe to TP24 to measure the SYRI signal from the BBIC.
8. The clock frequency should be within 10,368,000Hz ± 10Hz. If not then enter "SETFREQ nn nn" where nn nn are the clock frequency adjustment values. An increase in the value will lower the clock frequency and vice versa. The maximum value is 01 FF.
9. Switch off the 2.4V supply.

9.4. LOOPBACK TESTS

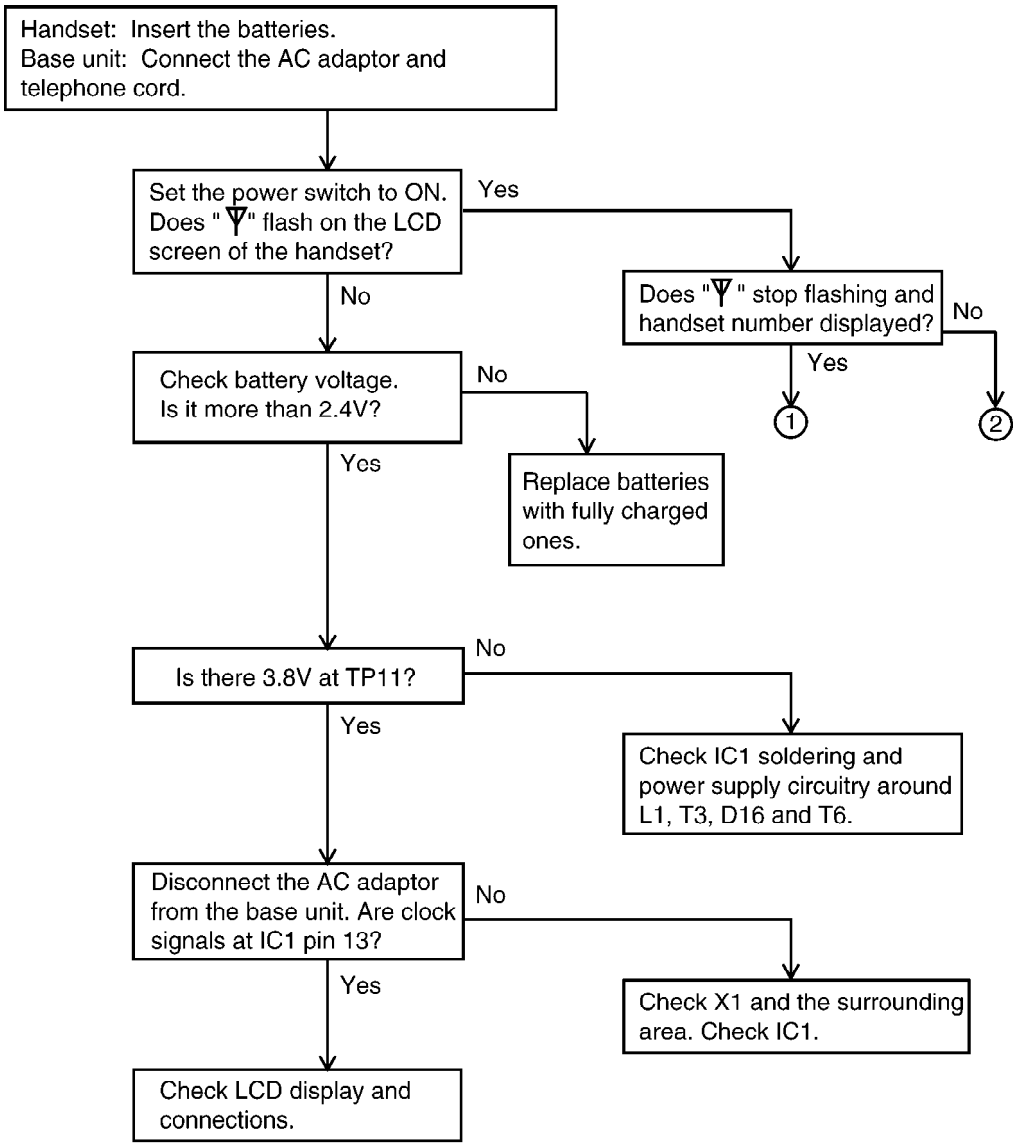
1. Connect the RF input cable from the CMD60 to the "0V" and "ANT" antenna pads.
2. Switch on the 2.4V supply.
3. Switch the handset on at the keypad.
4. Enter "RDEEPROM 00 4A 01". This will return the value "25" if a base has been registered to the handset, or "FF" if there is no base registered.
5. If a base is not registered to the unit (i.e. "FF" returned in step 4) then enter "SETBASE" to induce registration.
6. Set the CMD60 to MANUAL TEST mode.

7. Enter "TESTMODE" on the PC.
8. Enter "RDEEPROM 00 36 05" to obtain the base RFPI identifier.
9. Set the RFPI in the CMD60 to the value obtained in the previous step.
10. Press SETUP CONNECT on the CMD60.
11. Check the power (NTP): it must be between 20 and 25dBm.
12. Press MODULATION.
13. Set DATA TYPE to FIG 31.
14. Check frequency drift: must be 0 ± 35 kHz/ms.
15. Check frequency offset: must be 0 ± 40 kHz.
16. Check deviation or modulation (max ± B field) with data type "FIG 31": must be 320kHz to 400kHz.
17. Press Menu Up " ↑ " on the CMD60.
18. Press POWER RAMP.
19. Check that the burst fits the mask.
20. Press Menu Up " ↑ " on the CMD60.
21. Press BER.
22. Obtain the sensitivity by slowly reducing RF LEVEL until the BER falls below 1000ppm. The sensitivity is the RF LEVEL reading at this point. It must be < -88dBm.
23. Press Menu Up " ↑ " on the CMD60.
24. Press BEARER RELEASE and switch off the 2.4V supply.
25. If the "SETBASE" operation above was carried out then enter "RESBASE" to de-register.
26. Disconnect the RF cable.

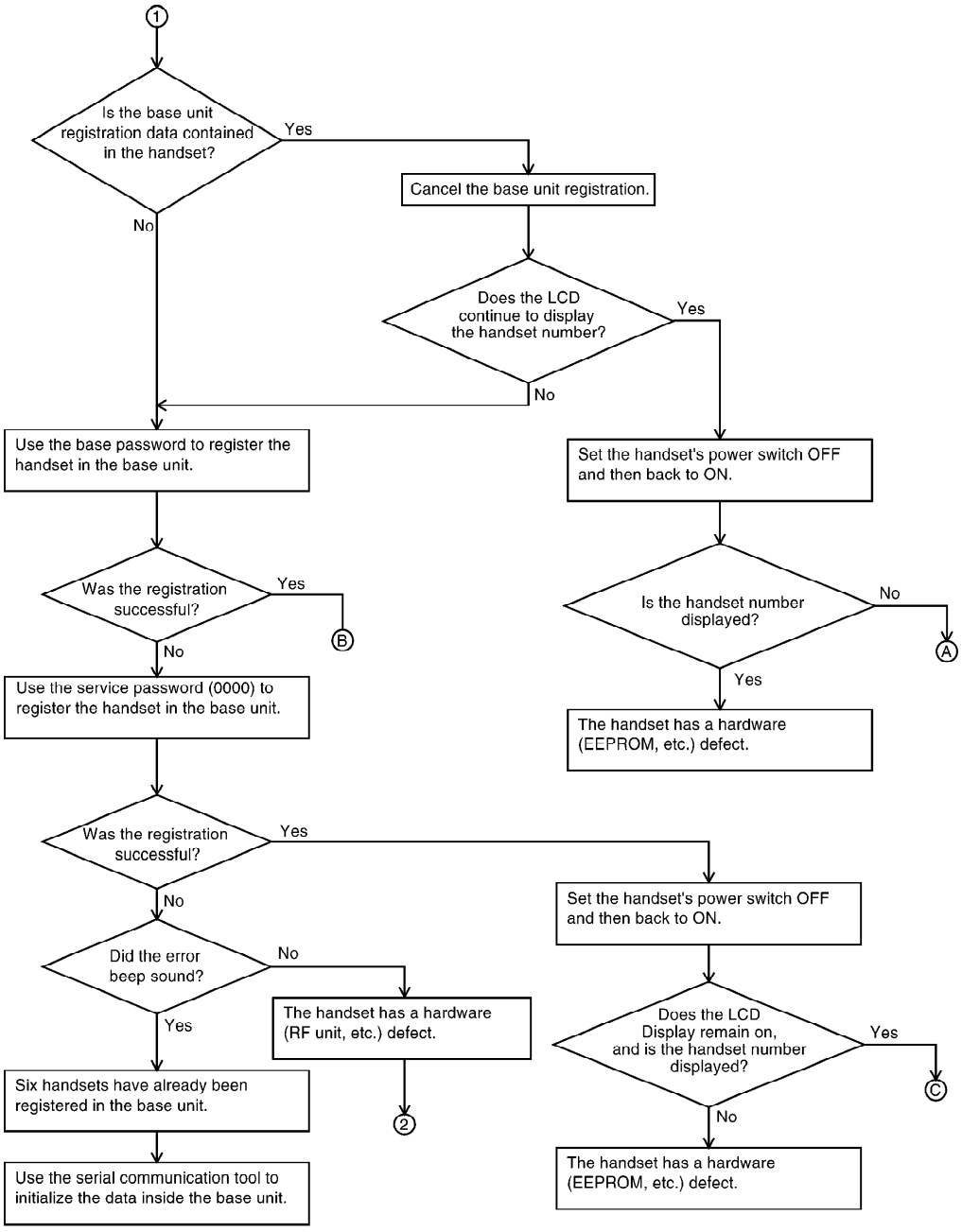
Note:
Step 2 to 24 can be repeated for TRAFFIC CARRIERS 0 and 9.

10. TROUBLESHOOTING GUIDE

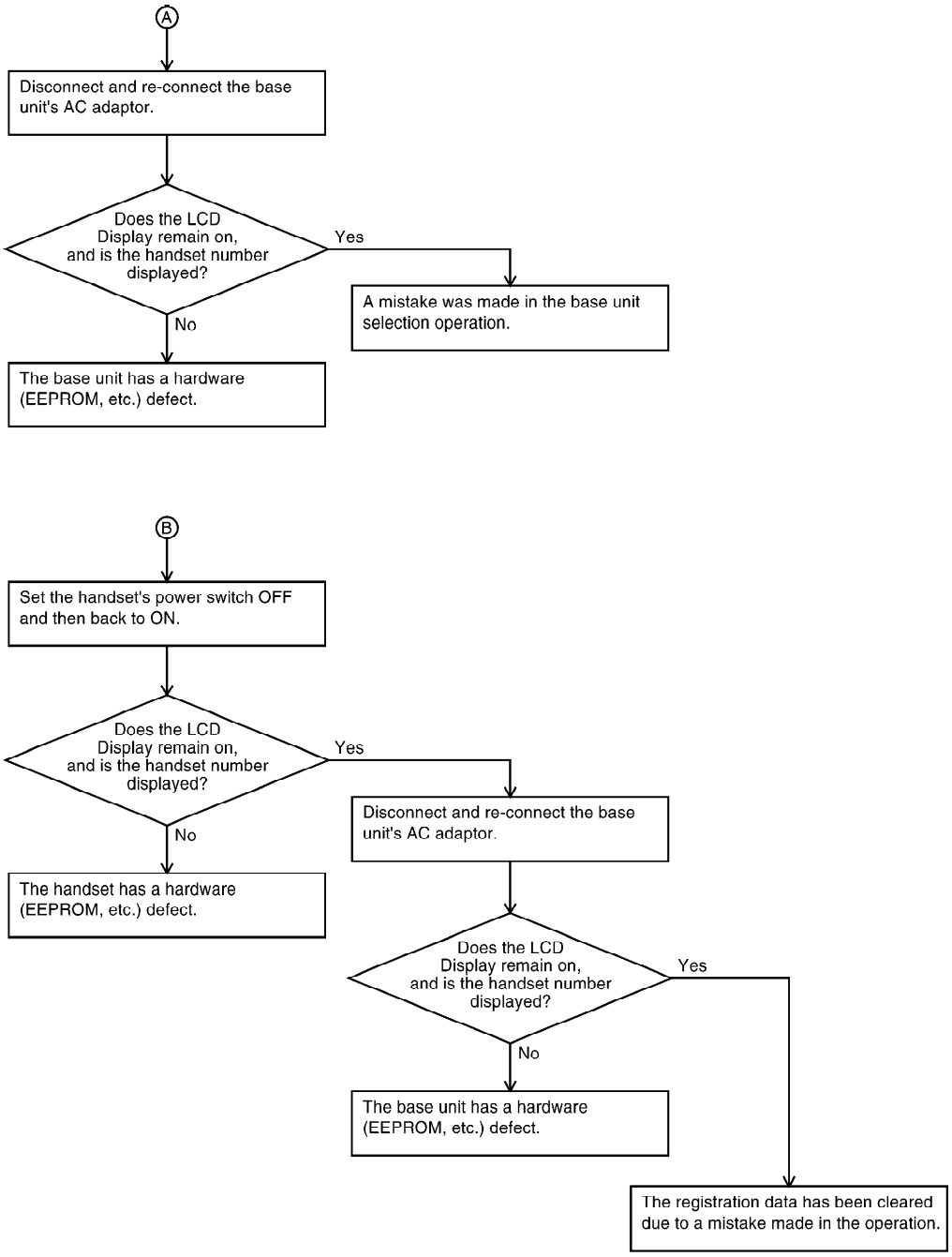
10.1. HANDSET: DOES NOT OPERATE

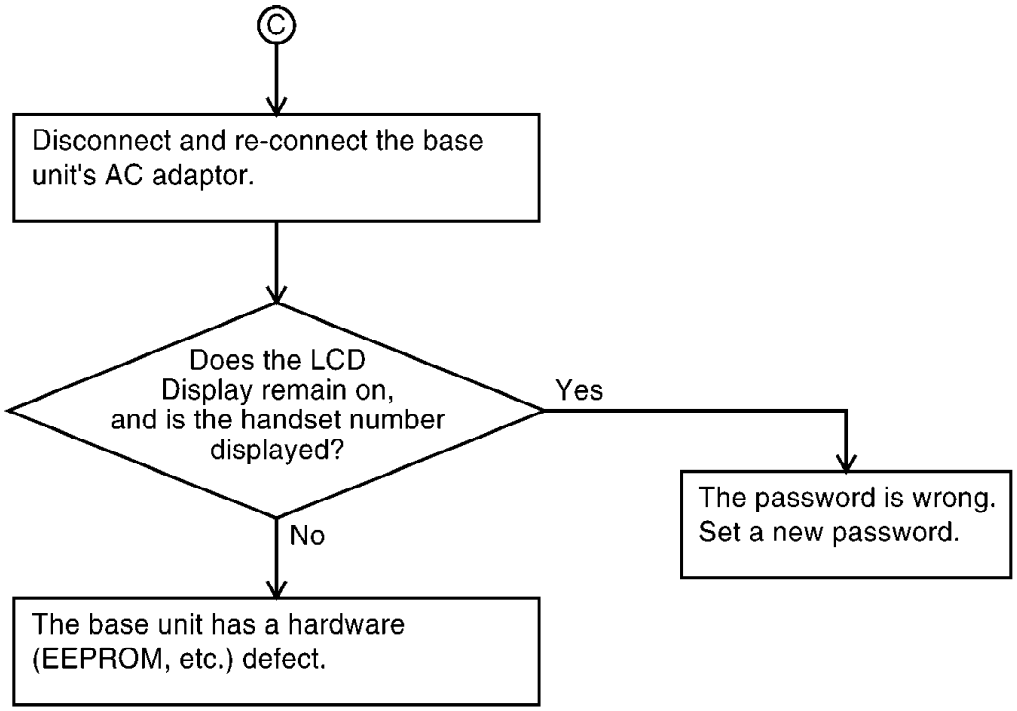

Handset: Insert the batteries.
Base unit: Connect the AC adaptor and telephone cord.
Set the power switch to ON. Does " " flash on the LCD screen of the handset?
Yes
No
Does " " stop flashing and handset number displayed?
No
Yes
1
2
Check battery voltage. Is it more than 2.4V?
No
Yes
Replace batteries with fully charged ones.
Is there 3.8V at TP11?
No
Yes
Check IC1 soldering and power supply circuitry around L1, T3, D16 and T6.
Disconnect the AC adaptor from the base unit. Are clock signals at IC1 pin 13?
No
Yes
Check X1 and the surrounding area. Check IC1.
Check LCD display and connections.

10.2. HANDSET: LINK

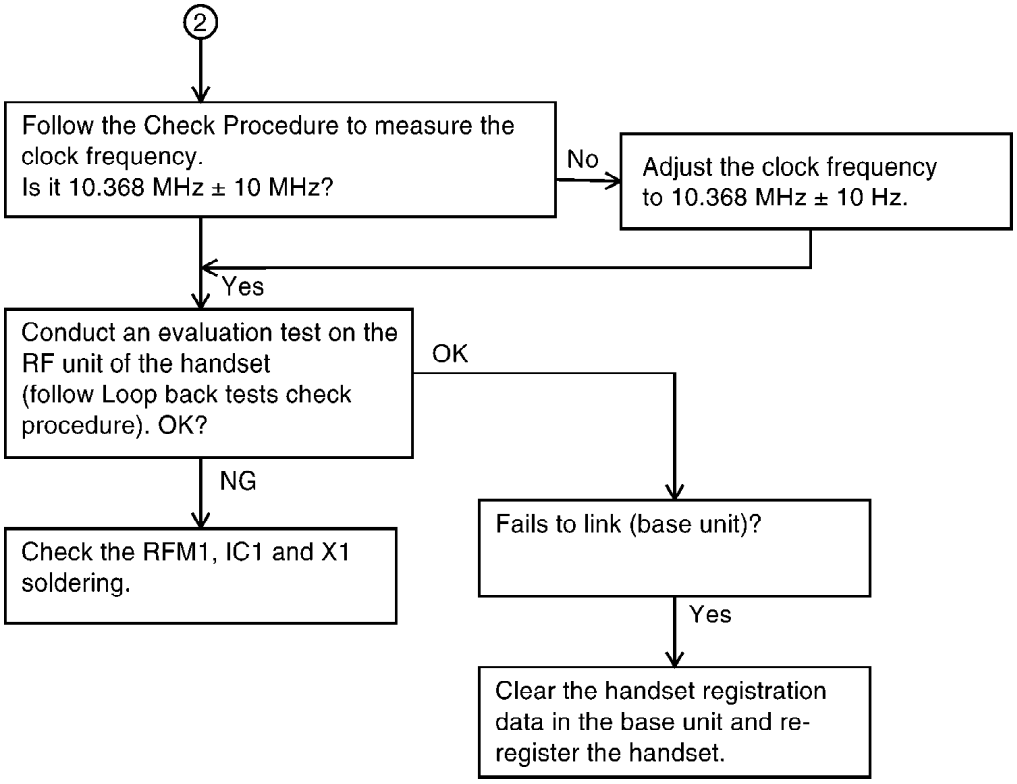

1
Is the base unit registration data contained in the handset?
Yes
No
Cancel the base unit registration.
Does the LCD continue to display the handset number?
Yes
No
Use the base password to register the handset in the base unit.
Set the handset's power switch OFF and then back to ON.
Was the registration successful?
Yes
B
No
Is the handset number displayed?
No
A
Yes
Use the service password (0000) to register the handset in the base unit.
The handset has a hardware (EEPROM, etc.) defect.
Was the registration successful?
Yes
No
Set the handset's power switch OFF and then back to ON.
Did the error beep sound?
No
Yes
The handset has a hardware (RF unit, etc.) defect.
Does the LCD Display remain on, and is the handset number displayed?
Yes
C
No
2
Six handsets have already been registered in the base unit.
The handset has a hardware (EEPROM, etc.) defect.
Use the serial communication tool to initialize the data inside the base unit.

(Use the method for clearing the registered handset data in the base unit.)

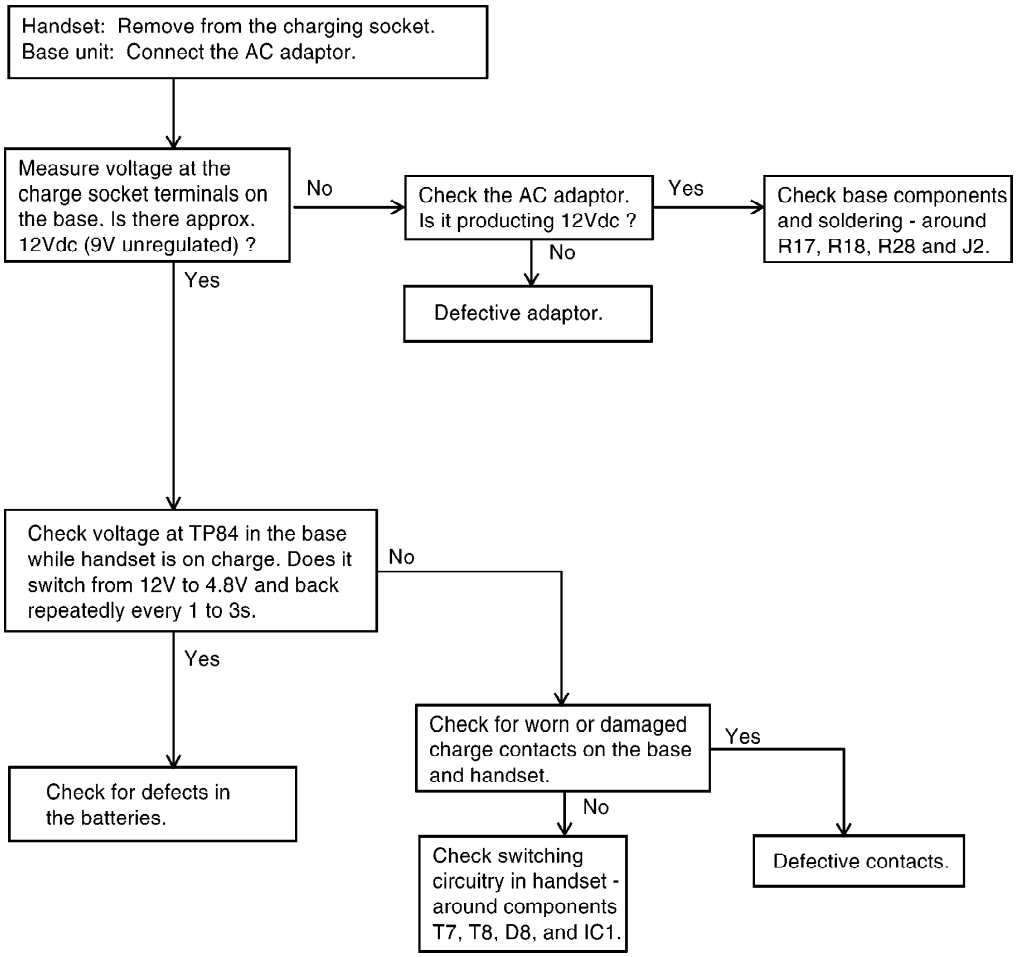

A
Disconnect and re-connect the base unit's AC adaptor.
Does the LCD Display remain on, and is the handset number displayed?
Yes
A mistake was made in the base unit selection operation.
No
The base unit has a hardware (EEPROM, etc.) defect.
B
Set the handset's power switch OFF and then back to ON.
Does the LCD Display remain on, and is the handset number displayed?
Yes
Disconnect and re-connect the base unit's AC adaptor.
No
The handset has a hardware (EEPROM, etc.) defect.
Does the LCD Display remain on, and is the handset number displayed?
Yes
No
The base unit has a hardware (EEPROM, etc.) defect.
The registration data has been cleared due to a mistake made in the operation.


C
Disconnect and re-connect the base unit's AC adaptor.
Does the LCD Display remain on, and is the handset number displayed?
Yes
The password is wrong. Set a new password.
No
The base unit has a hardware (EEPROM, etc.) defect.

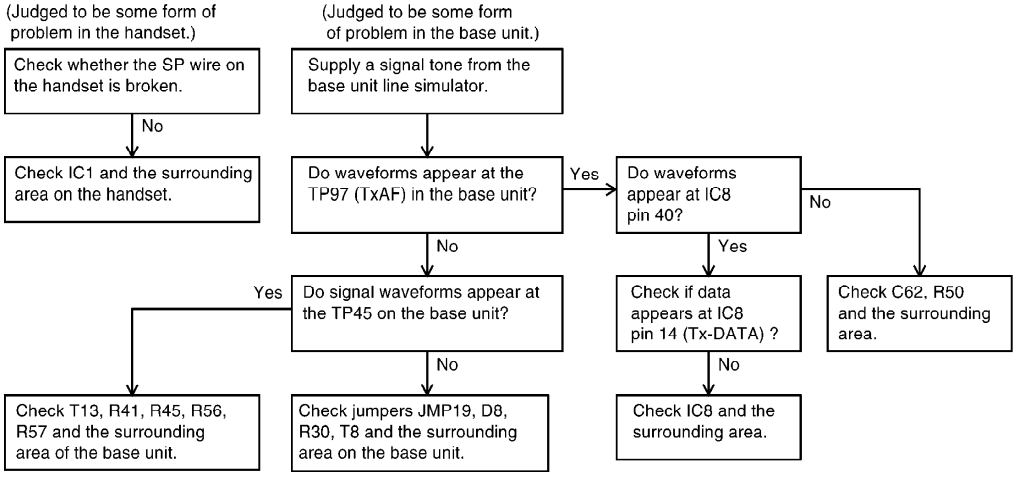
10.3. HANDSET: DOES NOT LINK


2
Follow the Check Procedure to measure the clock frequency. Is it 10.368 MHz ± 10 MHz?
No
Adjust the clock frequency to 10.368 MHz ± 10 Hz.
Yes
Conduct an evaluation test on the RF unit of the handset (follow Loop back tests check procedure). OK?
OK
NG
Check the RFM1, IC1 and X1 soldering.
Fails to link (base unit)?
Yes
Clear the handset registration data in the base unit and re-register the handset.

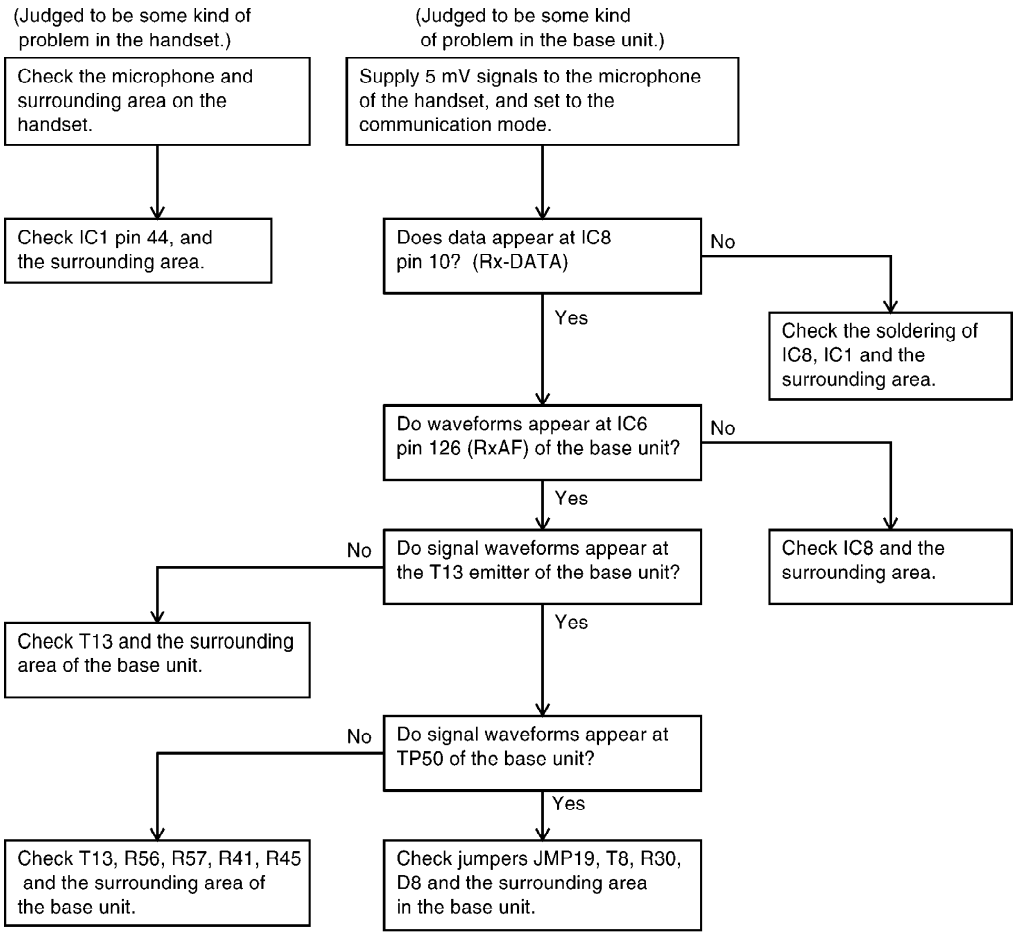
10.4. BATTERY DOES NOT CHARGE


Handset: Remove from the charging socket.
Base unit: Connect the AC adaptor.
Measure voltage at the charge socket terminals on the base. Is there approx. 12Vdc (9V unregulated) ?
No
Check the AC adaptor. Is it producting 12Vdc ?
Yes
Check base components and soldering - around R17, R18, R28 and J2.
No
Defective adaptor.
Yes
Check voltage at TP84 in the base while handset is on charge. Does it switch from 12V to 4.8V and back repeatedly every 1 to 3s.
No
Yes
Check for defects in the batteries.
Check for worn or damaged charge contacts on the base and handset.
Yes
No
Check switching circuitry in handset - around components T7, T8, D8, and IC1.
Defective contacts.

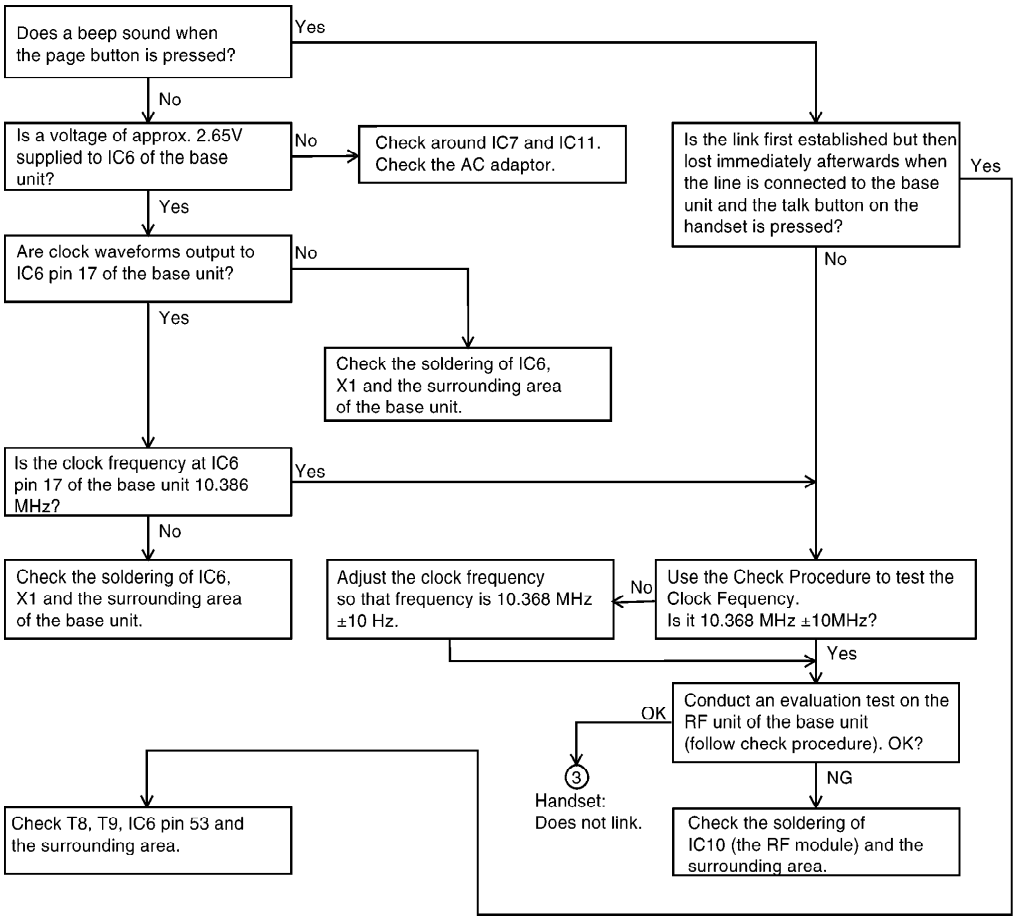
10.5. NO VOICE RECEPTION


(Judged to be some form of problem in the handset.)
(Judged to be some form of problem in the base unit.)
Check whether the SP wire on the handset is broken.
Supply a signal tone from the base unit line simulator.
No
Check IC1 and the surrounding area on the handset.
Do waveforms appear at the TP97 (TxAF) in the base unit?
Yes
Do waveforms appear at IC8 pin 40?
No
No
Yes
Yes
Do signal waveforms appear at the TP45 on the base unit?
Check if data appears at IC8 pin 14 (Tx-DATA) ?
Check C62, R50 and the surrounding area.
No
No
Check T13, R41, R45, R56, R57 and the surrounding area of the base unit.
Check jumpers JMP19, D8, R30, T8 and the surrounding area on the base unit.
Check IC8 and the surrounding area.

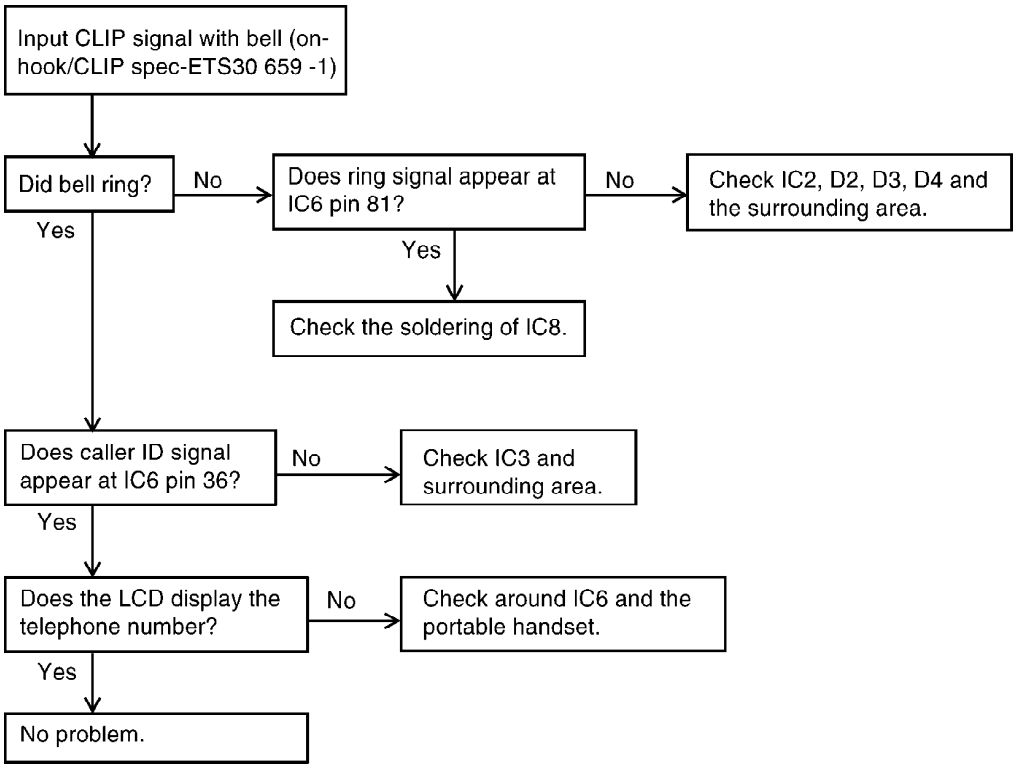
10.6. NO VOICE TRANSMISSION


(Judged to be some kind of problem in the handset.)
Check the microphone and surrounding area on the handset.
Check IC1 pin 44, and the surrounding area.
(Judged to be some kind of problem in the base unit.)
Supply 5 mV signals to the microphone of the handset, and set to the communication mode.
Does data appear at IC8 pin 10? (Rx-DATA)
No
Check the soldering of IC8, IC1 and the surrounding area.
Yes
Do waveforms appear at IC6 pin 126 (RxAF) of the base unit?
No
Check IC8 and the surrounding area.
Yes
Do signal waveforms appear at the T13 emitter of the base unit?
No
Check T13 and the surrounding area of the base unit.
Yes
Do signal waveforms appear at TP50 of the base unit?
No
Check T13, R56, R57, R41, R45 and the surrounding area of the base unit.
Yes
Check jumpers JMP19, T8, R30, D8 and the surrounding area in the base unit.

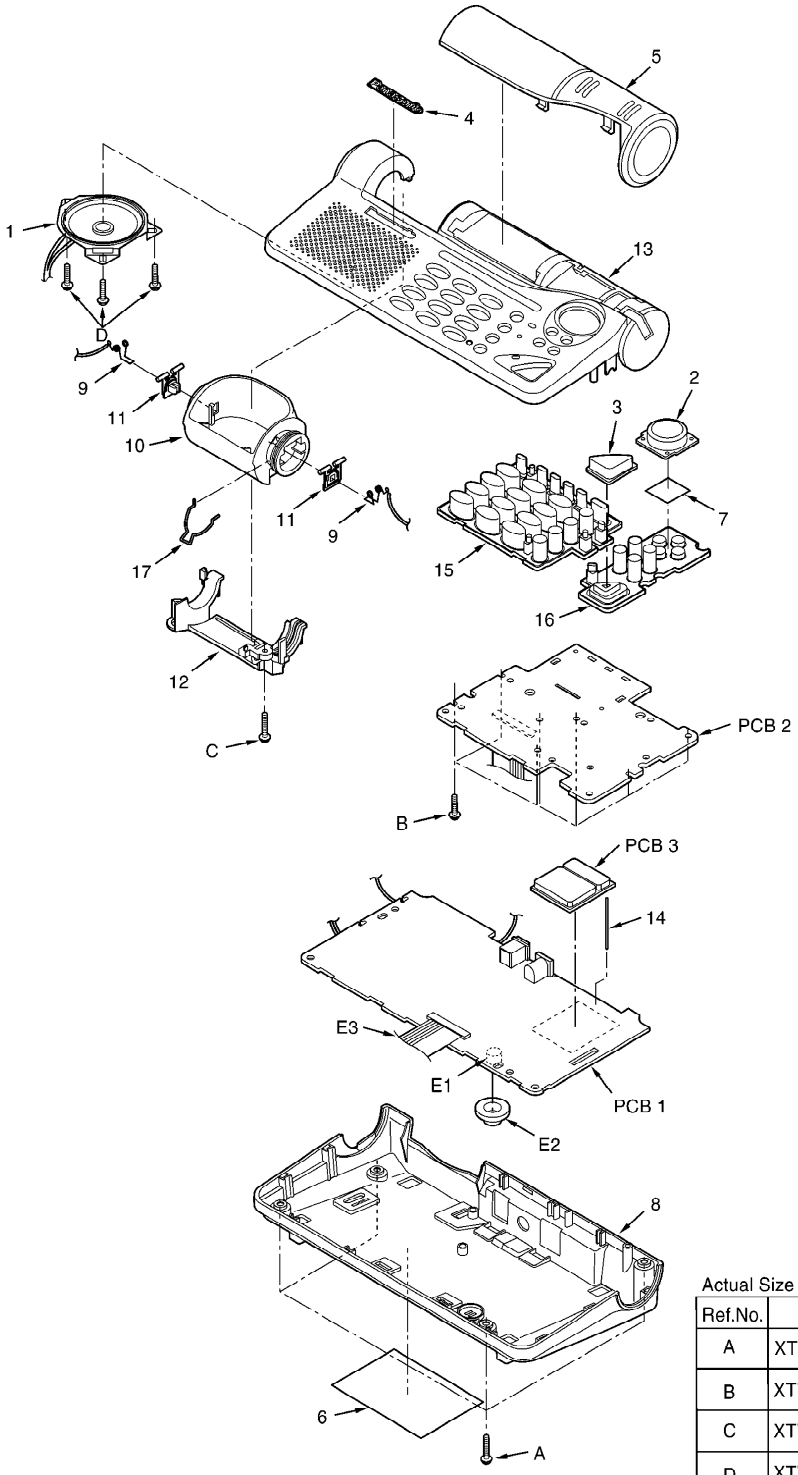
10.7. BASE UNIT: DOES NOT LINK


Does a beep sound when the page button is pressed?
Yes
No
Is a voltage of approx. 2.65V supplied to IC6 of the base unit?
No
Check around IC7 and IC11. Check the AC adaptor.
Yes
Are clock waveforms output to IC6 pin 17 of the base unit?
No
Check the soldering of IC6, X1 and the surrounding area of the base unit.
Yes
Is the clock frequency at IC6 pin 17 of the base unit 10.386 MHz?
Yes
No
Check the soldering of IC6, X1 and the surrounding area of the base unit.
Adjust the clock frequency so that frequency is 10.368 MHz ±10 Hz.
No
Use the Check Procedure to test the Clock Fequency. Is it 10.368 MHz ±10MHz?
Yes
Conduct an evaluation test on the RF unit of the base unit (follow check procedure). OK?
OK
NG
3
Handset: Does not link.
Check T8, T9, IC6 pin 53 and the surrounding area.
Check the soldering of IC10 (the RF module) and the surrounding area.
Is the link first established but then lost immediately afterwards when the line is connected to the base unit and the talk button on the handset is pressed?
Yes
No

10.8. BASE UNIT : CALLER ID PROBLEMS


Input CLIP signal with bell (on-hook/CLIP spec-ETS30 659 -1)
Did bell ring?
No
Does ring signal appear at IC6 pin 81?
No
Check IC2, D2, D3, D4 and the surrounding area.
Yes
Yes
Check the soldering of IC8.
Does caller ID signal appear at IC6 pin 36?
No
Check IC3 and surrounding area.
Yes
Does the LCD display the telephone number?
No
Check around IC6 and the portable handset.
Yes
No problem.

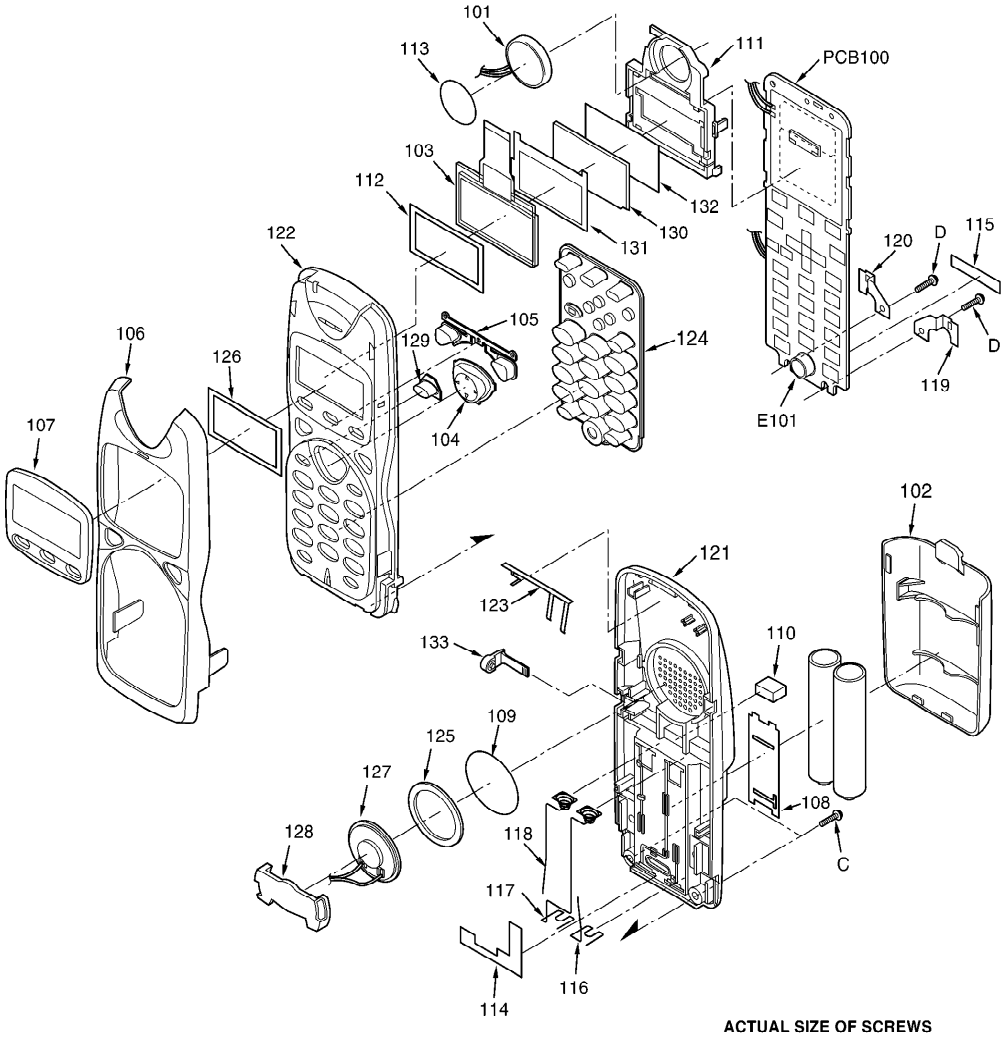
11. CABINET AND ELECTRICAL PARTS LOCATION (BASE UNIT)



Actual Size Screws

Ref.No.	Part No.	Figure
A	XTW26+14P	
B	XTW26+10P	
C	XTW26+10P	
D	XTW26+10P	

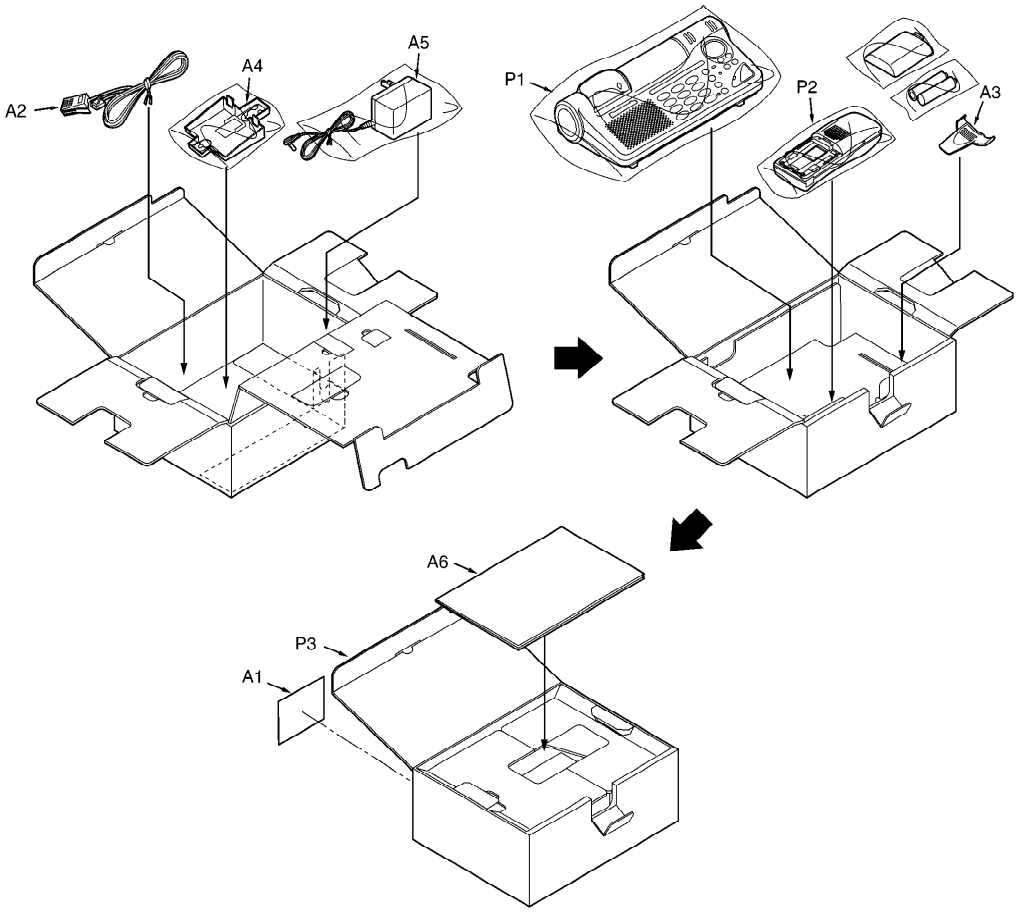
12. CABINET AND ELECTRICAL PARTS LOCATION (HANDSET)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
C	XTW2+Q8P	
D	XTB2+6G	

13. ACCESSORIES AND PACKING MATERIALS



14. REPLACEMENT PARTS LIST

Notes:

1. **The marking (RTL) indicates that the Retention Time is limited for this item.**
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.
   After the end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.**

4. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) P= μ μ F

***Type & Wattage of Resistor**

Type

ERC:Solid ERD:Carbon PQ4R:Chip	ERX:Metal Film ERG:Metal Oxide ERO:Metal Film	PQRD:Carbon PQRQ:Fuse ERF:Wire Wound

Wattege

10,16,18:1/8W	14,25,S2:1/4W	12,50,S1:1/2W	1:1W	2:2W	5:5W

ECFD:Semi-Conductor ECQS:Styrol PQCBX,ECUV:Chip ECMS:Mica	ECCD,ECKD,PQCBC,PQVP : Ceramic ECQM,ECQV,ECQE,ECQU,ECQB : Polyester ECEA,ECSZ,ECOS : Electrolytic ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H : 50V 2A : 100V 2E : 250V 2H : 500V	05 : 50V 1 : 100V 2 : 200V	OF : 3.15V 1A : 10V 1V : 35V OJ : 6.3V	OJ : 6.3V 1A : 10V 1C : 16V 1E,25 : 25V	1V : 35V 50,1H : 50V 1J : 63V 2A : 100V

14.1. Base Unit

14.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQAS57P03Y	SPEAKER	
2	PQBC10325Z1	NAVIGATOR BUTTON	S
3	PQBC10332Z1	SP PHONE BUTTON	S
4	PQGB7X	BADGE	
5	PQGG10120Z1	GRILLE	S
6	PQGT14546Z	NAME LABEL	
7	PQHX11083Z	PET SHEET	
8	PQYF10183X2	LOWER CABINET	S
9	PQJT10170Y	CHARGE TERMINAL	
10	PQKE10107X3	CHARGE CASE, PLASTIC	S
11	PQKE10111Z1	CHARGE TERMINAL CASE	S
12	PQKE10119Y2	CHARGE CASE HOLDER	S
13	PQKM10474Z1	UPPER CABINET	S
14	PQSA10124Z	ANTENNA	
15	PQSX10165Z	RUBBER SWITCH, 16 KEY	
16	PQSX10166Y	RUBBER SWITCH, 7 KEY	
17	PQUS10263Z	CLICK SPRING	

14.1.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1D715EH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC1	PQVILM1117MP	IC	S
IC2	PQVIPC357CN	IC	
IC3	PQVILMV321M5	IC	
IC5	PQWICD715-3H	IC	
IC6	C1CB00001367	IC	
IC7	PQVILM1117MP	IC	S
IC9	PQVIT2464WM6	IC	
IC11	C0CBAAE00017	IC	
IC12	C0JBAQ000158	IC	
IC14	PQVIMC34119D	IC	S
		(TRANSISTORS)	
T1	2SB709A	TRANSISTOR(SI)	S
T6	B1ABGE000004	TRANSISTOR(SI)	
T7	B1ABCE000009	TRANSISTOR(SI)	
T8	2SA1807	TRANSISTOR(SI)	
T9	PQVTBF822T7	TRANSISTOR(SI)	
T10	B1ABCE000009	TRANSISTOR(SI)	
T12	B1ABCE000009	TRANSISTOR(SI)	
T13	2SD874A	TRANSISTOR(SI)	
T14	2SD601A	TRANSISTOR(SI)	
		(DIODES)	
D2	PQVDBZV55C02	DIODE(SI)	
D3	PQVDBZV55C02	DIODE(SI)	
D4	MA111	DIODE(SI)	
D6	MA112	DIODE(SI)	
D7	MA8047	DIODE(SI)	
D8	PQVDS1ZB60F1	DIODE(SI)	S
D9	MA8047	DIODE(SI)	
D10	MA1Z300	DIODE(SI)	
D11	PQVDBZ55B2V4	DIODE(SI)	S
D12	PQVDDAN217	DIODE(SI)	
		(CONNECTORS)	
J1	PQJJ1T023Y	TEL JACK	
J2	PQJJ1T022Z	CONNECTOR	S
J3	PQJS25B37Z	FFC CONNECTOR	
		(OTHERS)	
E1	L0CBAB000040	MICROPHONE	
E2	PQMG10025Z	CUSHION RUBBER, MIC	
E3	PQJE10112Z	FFC	
X1	PQVCF1036N4Z	CRYSTAL OSCILLATOR	
SA3	PQVDDSS301L	SURGE ABSORBER	S
		(RESISTORS)	
R2	ERJ3GEYJ224	220k	
R3	PQ4R18XJ472	4.7k	S
R4	ERJ3GEYJ103	10k	
R5	ERJ3GEYJ224	220k	
R6	ERJ3GEYJ102	1k	
R8	ERJ3GEYJ102	1k	
R9	ERJ3GEYJ473	47k	
R10	ERJ3GEYJ473	47k	
R12	ERJ3GEYJ222	2.2k	
R13	ERJ3GEYJ103	10k	

Ref. No.	Part No.	Part Name & Description	Remarks
R15	ERJ3GEYJ222	2.2k	
R16	ERJ3GEYJ222	2.2k	
R17	ERJ1WYJ111	110	
R18	ERJ1WYJ680	68	
R19	ERJ3GEYJ474	470k	
R20	ERJ3GEYJ224	220k	
R21	ERJ3GEYJ474	470k	
R22	ERJ3GEYJ274	270k	
R23	ERJ3GEYJ101	100	
R25	ERJ3GEYJ103	10k	
R28	ERJ1WYJ111	110	
R29	ERJ3GEYJ101	100	
R30	PQ4R18XJ000	0	S
R35	ERJ3GEYJ104	100k	
R36	ERJ3GEYJ272	2.7k	
R37	ERJ3GEYJ101	100	
R38	ERJ3GEYJ101	100	
R39	ERJ3GEYJ103	10k	
R40	ERJ3GEYJ222	2.2k	
R41	ERJ3GEYJ333	33k	
R42	ERJ3GEYJ101	100	
R43	ERJ3GEYJ560	56	
R44	ERJ3GEYJ103	10k	
R45	ERJ3GEYJ103	10k	
R46	ERJ3GEYJ103	10k	
R47	ERJ3GEYJ102	1k	
R48	ERJ3GEYJ560	56	
R49	ERJ3GEYJ822	8.2k	
R50	ERJ3GEYJ101	100	
R51	ERJ3GEYJ101	100	
R52	ERJ3GEYJ102	1k	
R53	ERJ3GEYJ101	100	
R54	ERJ3GEYJ183	18k	
R55	ERJ3GEYJ104	100k	
R56	ERJ12YJ560	56	
R57	ERJ12YJ220	22	
R59	ERJ3GEYJ391	390	
R60	ERJ3GEYJ102	1k	
R61	ERJ3GEYJ102	1k	
R62	ERJ3GEYJ103	10k	
R63	ERJ3GEYJ391	390	
R64	ERJ3GEYJ391	390	
R67	ERJ3GEYJ331	330	
R68	ERJ3GEYJ681	680	
R69	ERJ3GEYJ154	150k	
R70	ERJ3GEYJ562	5.6k	
R71	ERJ3GEYJ224	220k	
R75	ERJ3GEYJ104	100k	
R76	ERJ3GEYJ104	100k	
R77	ERJ3GEYJ183	18k	
R78	ERJ3GEYJ183	18k	
R79	ERJ3GEYJ183	18k	
R80	ERJ3GEYJ183	18k	
R81	ERJ3GEYJ563	56k	

Ref. No.	Part No.	Part Name & Description	Remarks
R82	ERJ3GEYJ563	56k	
R83	ERJ3GEYJ472	4.7k	
R84	ERJ3GEYJ122	1.2k	
R87	ERJ3GEYJ154	150k	
R88	ERJ3GEYJ101	100	
R89	ERJ3GEYJ101	100	
R90	ERJ3GEYJ183	18k	
R91	ERJ3GEYJ563	56k	
R92	ERJ3GEYJ683	68k	
R93	ERJ3GEYJ183	18k	
R94	ERJ3GEYJ104	100k	
R95	ERJ3GEYJ683	68k	
R96	ERJ3GEYJ104	100k	
R97	ERJ3GEYJ103	10k	
R98	ERJ3GEYJ103	10k	
R99	ERJ3GEYJ103	10k	
R100	ERJ3GEYJ103	10k	
R101	ERJ3GEYJ101	100	
R102	ERJ3GEYJ103	10k	
R103	ERJ3GEYJ103	10k	
R104	ERJ3GEYJ103	10k	
R105	ERJ3GEYJ103	10k	
R106	ERJ3GEYJ103	10k	
R107	ERJ3GEYJ103	10k	
R108	ERJ3GEYJ103	10k	
R109	ERJ3GEYJ1R5V	1.5	
R110	ERJ3GEYJ101	100	
R111	ERJ3GEYJ102	1k	
R112	ERJ3GEYJ472	4.7k	
R113	ERJ3GEYJ103	10k	
R130	ERJ3GEYJ154	150k	
R131	ERJ3GEYJ103	10k	
R132	ERJ3GEYJ102	1k	
R133	ERJ3GEYJ102	1k	
R137	ERJ3GEYJ102	1k	
R138	ERJ3GEYJ152	1.5k	
R139	ERJ3GEYJ472	4.7k	
R140	ERJ3GEYJ333	33k	
R141	ERJ3GEYJ102	1k	
R142	ERJ3GEYJ000	0	
R143	ERJ3GEYJ000	0	
R144	PQ4R18XJ000	0	S
R146	ERJ3GEYJ000	0	
R147	ERJ3GEYJ000	0	
R148	ERJ3GEYJ000	0	
R149	ERJ3GEYJ000	0	
R150	ERJ3GEYJ000	0	
R151	ERJ3GEYJ000	0	
R152	ERJ3GEYJ000	0	
R153	ERJ3GEYJ000	0	
R154	ERJ3GEYJ000	0	
R155	ERJ3GEYJ000	0	
R156	ERJ3GEYJ000	0	
R157	ERJ3GEYJ000	0	

Ref. No.	Part No.	Part Name & Description	Remarks
JMP19	PQ4R10XJ000	0	S
JMP51	PQ4R10XJ000	0	S
L4	ERJ3GEYJ000	0	
L5	ERJ3GEYJ000	0	
L6	ERJ3GEYJ000	0	
		(CAPACITORS)	
C1	ECUV1C104KBV	0.1	
C2	ECQE2E474KZ	0.47	S
C3	ECUV1C104KBV	0.1	
C4	ECUV1H0R5CCV	0.5	
C6	ECUV1C104KBV	0.1	
C8	ECUV1H151JCV	150P	
C9	ECUV1H151JCV	150P	
C10	ECUV1H121JCV	120P	
C11	ECUV1H100DCV	10P	
C12	ECUV2H102KB	0.001	
C13	ECUV1H151JCV	150P	
C14	ECUV2H102KB	0.001	
C15	ECUV1H151JCV	150P	
C16	ECUV2H681KB	680P	
C17	ECUV2H681KB	680P	
C19	ECST1AY106	10	
C20	ECUV1H100DCV	10P	
C26	ECST0JY225	2.2	
C27	ECUV1H472KBV	0.0047	
C28	PQCUV1C224KB	0.22	
C30	ECUV1H100DCV	10P	
C31	ECUV1H100DCV	10P	
C34	PQCUV1H154KB	0.15	
C36	ECEV1VA100SR	10	
C40	PSCEV1CA101	100P	S
C41	ECUV1H100DCV	10P	
C42	PSCEV1CA101	100P	S
C43	ECUV1H100DCV	10P	
C45	ECUV1H100DCV	10P	
C46	ECUV1H100DCV	10P	
C47	ECUV1A225KB	2.2	
C48	PQCUV1C105KB	1	
C49	ECUV1C104KBV	0.1	
C50	ECUV1H100DCV	10P	
C52	ECUV1C823KBV	0.082	
C53	ECUV1H470JCV	47P	
C54	ECUV1H100DCV	10P	
C55	ECUV1C104KBV	0.1	
C56	ECUV1C104KBV	0.1	
C57	ECUV1C104KBV	0.1	
C58	ECUV1C104KBV	0.1	
C59	ECUV1C104KBV	0.1	
C60	ECUV1H100DCV	10P	
C61	PQCUV1C224KB	0.22	
C62	ECUV1C104KBV	0.1	
C63	ECUV1H100DCV	10P	
C64	ECUV1C823KBV	0.082	
C65	PSCEV1CA101	100P	S

Ref. No.	Part No.	Part Name & Description	Remarks
C66	ECUV1E333KBV	0.033	
C69	ECUV1C104KBV	0.1	
C70	ECUV1H100DCV	10P	
C71	ECUV1E333KBV	0.033	
C72	ECUV1E333KBV	0.033	
C73	ECUV1H6R8CCV	6.8	
C74	ECUV1H6R8CCV	6.8	
C75	ECUV1H6R8CCV	6.8	
C76	ECUV1H221JCV	220P	
C77	ECUV1C104KBV	0.1	
C78	ECUV1H100DCV	10P	
C79	ECUV1C104KBV	0.1	
C83	ECST1CY105	1	
C84	ECUV1H100DCV	10P	
C85	ECUV1H220JCV	22P	
C86	ECUV1H220JCV	22P	
C87	ECST1AY475	4.7	
C89	ECUV1H100DCV	10P	
C90	ECUV1H100DCV	10P	
C91	PSCEV1CA101	100P	S
C92	ECUV1H100DCV	10P	
C101	ECUV1C105ZFV	1	
C103	ECUV1C105ZFV	1	
C104	ECUV1C105ZFV	1	
C105	ECUV1H270JCV	27P	
C107	ECUV1H153KBV	0.015	
C110	ECUV1C104KBV	0.1	
C111	ECUV1C563KBV	0.056	
C112	ECUV1C563KBV	0.056	
C113	ECUV1H562KBV	0.0056	
C114	ECUV1C104KBV	0.1	
C115	PQCUV1C225ZF	2.2	
C116	ECUV1H221JCV	220P	
C118	ECUV1H151JCV	150P	
C126	ECUV1C225KB	2.2	

14.1.3. KEYPAD P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQWP2D715CEH	KEY PAD P.C.BOARD ASS'Y (RTL)	
		(TRANSISTORS)	
T1	PQVTDTC143K	TRANSISTOR(SI)	
T2	PQVTDTC143K	TRANSISTOR(SI)	
T4	PQVTDTC143K	TRANSISTOR(SI)	
T5	PQVTDTC143K	TRANSISTOR(SI)	
		(DIODES)	
D1	LNJ311G8TRU	DIODE(SI)	
D2	LNJ211R8ARU	DIODE(SI)	
D14	LNJ311G8TRU	DIODE(SI)	
D15	LNJ211R8ARU	DIODE(SI)	
		(OTHERS)	
J1	PQJS25B37Z	CONNECTOR	
		(RESISTORS)	
R2	ERJ3GEYJ101	100	
R3	ERJ3GEYJ271	270	
R5	ERJ3GEYJ101	100	
R6	ERJ3GEYJ271	270	
R8	PQ4R18XJ000	0	S
R9	PQ4R18XJ000	0	S
R10	PQ4R18XJ000	0	S
R11	PQ4R18XJ000	0	S

14.1.4. RF MODULE

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PQLZ10015Z	RF MODULE (IC10)	

14.2. Handset

14.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	L0AD02A00006	RECEIVER	
102	PQKK10109Z5	BATTERY COVER	S
103	L5CBDC00003	LCD DOT MATRIX	
104	PQBC10323Y1	NAVIGATOR KEY	S
105	PQBX10345Y1	FUNCTION BUTTON	S
106	PQGG10116Z5	FRONT CABIET GRILL	S
107	PQGP10176Y2	LCD PANEL	S
108	PQGT14535Z	NAME LABEL	
109	PQHS10457Z	SPEAKER NET	
110	PQHG10634X	RUBBER	
111	PQHR10779Y	LCD HOLDER	
112	PQHS10430Y	LCD SPONGE	
113	PQHS10467Z	RECEIVER NET	
114	PQHX10990Y	SHEET PET	
115	PQHX11030Z	INSULATION TAPE	
116	PQJC10046Z	BATTERY TERMINALS (A)	
117	PQJC10047Y	BATTERY TERMINALS (B)	
118	PQJC10048Y	BATTERY TERMINALS (C)	
119	PQJT10168Y	CHARGE TERMINAL (L)	
120	PQJT10169Y	CHARGE TERMINAL (R)	
121	PQKF10497Z5	REAR CABIET	S
122	PQKM10464Z4	FRONT CABINET	S
123	PQSA10117Y	ANTENNA	
124	PQSX10155Y	RUBBER KEYPAD	
125	PQHG10589Y	SPEAKER SPONGE	
126	PQHS10429X	DOUBLE SIDED TAPE	
127	PQAS3P07Y	SPEAKER	
128	PQHR10778Z	SPEAKER HOLDER	
129	PQBC10314Z1	SP BUTTON	S
130	PQHR10781Z	LCD PLATE	
131	PQHX10962Z	LCD COVER SHEET	
132	PQHX10963Y	LCD REFLECTOR SHEET	
133	PQKE10108Z2	EAR PIECE CAP	S

14.2.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPCD735CER	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC1	PQVI6723L22	IC	
IC2	C3EBHC000001	IC	S
IC3	PQWICD735CER	IC	
IC400	PMB6818	IC	
IC402	PMB6610V12	IC	S
HF_AM1	PQVINJM2135M	IC	
		(TRANSISTORS)	
T1	B1GBCFGC0001	TRANSISTOR(SI)	S
T3	PQVTSI2302DS	TRANSISTOR(SI)	
T5	B1GBCFGC0001	TRANSISTOR(SI)	S
T6	PQVTBC80725T	TRANSISTOR(SI)	S
T7	PQVTBC80740T	TRANSISTOR(SI)	S
T8	B1GBCFGC0001	TRANSISTOR(SI)	S
T11	DTC143XKA106	TRANSISTOR(SI)	
T12	DTC143XKA106	TRANSISTOR(SI)	
T400	BC858BW	TRANSISTOR(SI)	
		(DIODES)	
D1	LNJ115W89RA	DIODE(SI)	
D2	LNJ115W89RA	DIODE(SI)	
D3	LNJ115W89RA	DIODE(SI)	
D4	MA111	DIODE(SI)	
D5	MA111	DIODE(SI)	
D6	MA111	DIODE(SI)	
D7	MA8047	DIODE(SI)	
D8	MA112	DIODE(SI)	
D9	MA8047	DIODE(SI)	
D11	B3ABB0000001	DIODE(SI)	S
D12	B3ABB0000001	DIODE(SI)	S
D13	B3ABB0000001	DIODE(SI)	S
D14	B3ABB0000001	DIODE(SI)	S
D16	MA2H73600L	DIODE(SI)	
D17	PQVDBR1111C	DIODE(SI)	S
D18	PQVDBZV55C47	DIODE(SI)	S
D19	PQVDBZV55C47	DIODE(SI)	S
D21	PQVDBZV55C47	DIODE(SI)	S
D400	PQVDBAR6405	DIODE(SI)	
		(COILS)	
L1	G1A220F00005	COIL	
L2	ELJPA100KF	COIL	
L3	ELJPA100KF	COIL	
L4	PQLQR2K1A102	COIL	
L400	G1C4N7Z00005	COIL	
L401	G1C4N7Z00005	COIL	
L402	G1C22NKA0025	COIL	
L405	PSLQR2B2N7S	COIL	
L406	PSLQR2B2N7S	COIL	
F1	PQLQR2M6N8KT	COIL	
		(CONNECTORS)	
J5	PSJS22A62Z	LCD CONNECTOR	
J6	PQJJ1C002Z	HEADSET JACK	
		(OTHERS)	
A1a	PQJT10152Y	CHARGE PAD	

Ref. No.	Part No.	Part Name & Description	Remarks
A1b	PQJT10152Y	CHARGE PAD	
J1	PQJT10152Y	CHARGE PAD	
J2	PQJT10152Y	CHARGE PAD	
E101	PQJM146Z	MICROPHONE	
RFCAN 1	PQMC10417Z	RFCAN 1	
RFCAN 2	PQMC10418Z	RFCAN 2	
X1	PQVCF1036N3Z	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R1	ERJ3GEYJ222	2.2k	
R2	ERJ3GEYJ184	180k	
R3	ERJ3GEYJ000	0	
R4	ERJ3GEYJ330	33	
R5	ERJ3GEYJ330	33	
R6	ERJ3GEYJ471	470	
R7	ERJ3GEYJ120	12	
R8	ERJ3GEYJ471	470	
R9	ERJ3GEYJ223	22k	
R10	ERJ3GEYJ393	39k	
R11	ERJ3GEYJ181	180	
R12	ERJ3GEYJ181	180	
R13	ERJ3GEYJ100	10	
R14	ERJ3GEYJ124	120k	
R15	ERJ3GEYJ473	47k	
R16	PQ4R18XJR10	0.1	
R17	ERJ3GEYJ683	68k	
R18	ERJ3GEYJ563	56k	
R20	ERJ3GEYJ181	180	
R21	ERJ3GEYJ471	470	
R22	ERJ3GEYJ120	12	
R23	ERJ3GEYJ120	12	
R24	ERJ3GEYJ471	470	
R27	ERJ3GEYJ220	22	
R28	ERJ3GEYJ220	22	
R29	ERJ3GEYJ103	10k	
R35	ERJ3GEYJ824	820k	
R36	ERJ3EKF4303	430k	
R37	ERJ3GEYJ224	220k	
R42	ERJ3GEYJ153	15k	
R43	ERJ3GEYJ560	56	
R50	ERJ3GEYJ103	10k	
R51	PQ4R18XJ471	470	
R52	PQ4R10XJ122	1.2k	
R54	ERJ3GEYJ224	220k	
R55	ERJ3GEYJ104	100k	
R56	PQ4R10XJ2R7	2.7	
R59	ERJ3GEYJ103	10k	
R60	ERJ3GEYJ103	10k	
R61	ERJ3GEYJ224	220k	
R62	ERJ3GEYJ104	100k	
R67	ERJ3GEYJ101	100	
R68	ERJ3GEYJ101	100	
R69	ERJ3GEYJ104	100k	
R70	ERJ3GEYJ104	100k	
R404	ERJ3GEYJ1R0	1	

Ref. No.	Part No.	Part Name & Description	Remarks
R406	ERJ3GEYJ100	10	
R408	ERJ3GEYJ561	560	
R409	ERJ3GEYJ331	330	
R410	ERJ3GEYJ273	27k	
R411	ERJ3GEYJ472	4.7k	
R412	ERJ3GEYJ272	2.7k	
R413	ERJ3GEYJ682	6.8k	
R414	ERJ3GEYJ183	18k	
R415	ERJ3GEYJ152	1.5k	
R416	ERJ3GEYJ331	330	
R417	ERJ3GEYJ272	2.7k	
R418	ERJ3GEYJ1R0	1	
C47	ERJ3GEYJ473	47k	
		(CAPACITORS)	
C1	ECUV1C683KBV	0.068	
C2	ECUV1C683KBV	0.068	
C3	ECUV1C683KBV	0.068	
C4	ECST1AD227	220	
C5	ECUV1C683KBV	0.068	
C6	ECUV1H030CCV	3P	
C7	ECUV1H220JCV	22P	
C8	PQCUV1A105KB	1	
C10	ECUV1H220JCV	22P	
C12	ECUV1C104KBV	0.1	
C13	ECUV1C104KBV	0.1	
C14	ECUV1C104KBV	0.1	
C15	ECUV1C104KBV	0.1	
C16	ECUV1C683KBV	0.068	
C17	ECUV1H100DCV	10P	
C18	ECST1AY475	4.7	
C19	ECUV1H100DCV	10P	
C20	ECUV1H100DCV	10P	
C21	ECUV1H100DCV	10P	
C22	ECUV1H100DCV	10P	
C23	ECUV1H100DCV	10P	
C24	ECUV1H331JCV	330P	
C25	ECUV1H100DCV	10P	
C26	ECUV1H100DCV	10P	
C27	ECUV1H100DCV	10P	
C28	ECUV1A225KB	2.2	
C29	ECUV1H100DCV	10P	
C30	ECUV1C104KBV	0.1	
C31	ECUV1C104KBV	0.1	
C32	ECUV1C104KBV	0.1	
C33	ECUV1C104KBV	0.1	
C34	ECUV1H100DCV	10P	
C35	ECST1AY106	10	
C36	ECUV1C104KBV	0.1	
C37	ECUV1C104KBV	0.1	
C38	ECUV1H100DCV	10P	
C39	PQCUV1C474KB	0.47	
C40	PQCUV1C474KB	0.47	
C41	ECUV1H100DCV	10P	
C42	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C43	ECUV1C104KBV	0.1	
C44	ECUV1C104KBV	0.1	
C45	ECUV1C104KBV	0.1	
C46	ECUV1C104KBV	0.1	
C48	ECUV1C104KBV	0.1	
C49	ECST1AY106	10	
C50	ECUV1C104KBV	0.1	
C51	ECUV1C104KBV	0.1	
C52	PQCUV1E104MD	0.1	S
C53	ECUV1C104KBV	0.1	
C54	ECUV1C104KBV	0.1	
C55	ECUV1H103KBV	0.01	
C56	ECUV1C683KBV	0.068	
C57	ECUV1C104KBV	0.1	
C58	ECUV1C104KBV	0.1	
C59	ECUV1C104KBV	0.1	
C60	ECUV1H100DCV	10P	
C61	ECUV1H100DCV	10P	
C62	ECUV1H100DCV	10P	
C63	ECUV1C224ZFV	0.22	
C64	ECUV1C224ZFV	0.22	
C65	ECUV1H100DCV	10P	
C66	ECUV1H100DCV	10P	
C67	ECUV1H100DCV	10P	
C400	ECUV1H1R8CCV	1.8	
C402	ECUV1H100DCV	10P	
C404	ECUV1H100DCV	10P	
C405	ECUV1H100DCV	10P	
C406	ECUV1H331JCV	330P	
C407	ECUV1H100DCV	10P	
C408	ECUV1H330JCV	33P	
C409	PQCUV1H102J	0.001	
C410	0805N472J500	0.0047	
C411	ECUV1H102KBV	0.001	
C412	ECUV1H100DCV	10P	
C413	ECUV1H103KBV	0.01	
C414	PQCUV1H222JC	0.0022	
C415	ECUV1H100DCV	10P	
C416	0805N472J500	0.0047	
C417	ECUV1H103KBV	0.01	
C418	ECUV1H1R5CCV	1.5	
C419	ECUV1H100DCV	10P	
C420	ECUV1H100DCV	10P	
C421	ECUV1H100DCV	10P	
C422	ECUV1H100DCV	10P	
C423	ECUV1H330JCV	33P	
C424	0603N1R8B500	1.8	
C426	ECUV1C104KBV	0.1	
C427	ECUV1H100DCV	10P	
C428	ECUV1H100DCV	10P	
C429	ECUV1H103KBV	0.01	
C431	ECUV1H100DCV	10P	
C432	ECUV1H100DCV	10P	
C433	ECUV1H100DCV	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
C434	ECUV1H180JCV	18P	
C435	ECUV1H2R2CCV	2.2	
C436	ECUV1H100DCV	10P	
C437	ECUV1H221JCV	220P	
C438	ECUV1H1R5CCV	1.5	
C439	ECUV1H010CCV	1P	
C440	ECUV1H100DCV	10P	
C441	ECUV1H100DCV	10P	
C442	ECUV1H1R2CCV	1.2	
C443	ECUV1H1R8CCV	1.8	
C444	0603N1R8B500	1.8	
C445	ECUV1H100DCV	10P	
C446	ECUV1C104KBV	0.1	
C447	ECUV1H100DCV	10P	
C448	ECUV1H100DCV	10P	
C449	ECUV1H180JCV	18P	
C450	ECUV1H1R5CCV	1.5	
C451	ECUV1H010CCV	1P	
C452	ECUV1H010CCV	1P	
C455	PQCUV1A105KB	1	
C456	ECUV1H1R8CCV	1.8	
C457	ECUV1H1R8CCV	1.8	
C458	ECUV1H1R8CCV	1.8	
R19	ECUV1H100DCV	10P	

14.2.3. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQGT14546Z	NAME LABEL	
A2	PQJA87S	TEL CORD	
A3	PQKE10120Z2	BELT CLIP	S
A4	PQKL10038Y2	WALL MOUNT ADAPTOR	S
A5	PQLV1EZ	AC ADAPTOR	⚠
A6	PQQX12950Y	INSTRUCTION BOOK	
P1	PQPP10085Z	POLY BAG (for Base Unit)	
P2	PQPP10084Z	POLY BAG (for Handset)	
P3	PQPK13323Z	CARTON BOX	

15. EEPROM LAYOUT (BASE UNIT)

15.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC9) for the TCD715 Base Unit.
The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the base e.g. crystal frequency adjustment at address 0000 and 0001, some are set by the user configuration e.g. ringer volume at address 0210, and some are set during normal use of the phone e.g. meter pulse billing at address 1040..015F.

15.2. Introduction

The base unit uses a 64k bit (8192 x 8) serial EEPROM (IC9) for storing volatile parameters. All parameters are set up before the base leaves the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.
In the tables below values in a range that are similar are not repeated; i.e. Address 00 to 01 contains the value 00 simply means that the value 00 is repeated in all addresses in the range. All values in this document are in hexadecimal notation.

Type	Name	Description
D	default	The EEPROM location is preset to the Default value by the eeprom default
A	adjust	The EEPROM location is set during the production test and should not be overwritten. The value is set by the eeprom default loader only if the locati contains all 1's (byte: 0xFF, word FFFFh), i, e. it has never been set.
-		EEPROM location which is not set at all.
d	default	Same as D but best-guess value and/or not verified.

15.3. EEPROM Layout

15.3.1. General Setup

Address	Default	Name	Type	Description
0000-01	00 E0	EepromOscillator	A	Frequency adjustment
0002	20	ModulationDeviation	A	Mudulation adjustment
001E-001F	??..??	Reserved	-	Protocol data
0020	00 .. 00	RFPI	A	RFPI
0025	00 00	AC	D	AC code
0027	00	DiversityMode	D	Diversity mode: 0: Diversity 1: Fixed on antenna 1 2: Fixed on antenna 2
0030-0034	FF .. FF	IPUI_1	D	Ipui for handset 1. If set to FF .. FF handset is not enrolled.
0035-0039	FF .. FF	IPUI_2	D	Ipui for handset 2. If set to FF .. FF handset is not enrolled.
003A-003E	FF .. FF	IPUI_3	D	Ipui for handset 3. If set to FF .. FF handset is not enrolled.
003F-0043	FF .. FF	IPUI_4	D	Ipui for handset 4. If set to FF .. FF handset is not enrolled.

Address	Default	Name	Type	Description
0044-0048	FF .. FF	IPUI_5	D	Ipui for handset 5. If set to FF .. FF handset is not enrolled.
0049-004D	FF .. FF	IPUI_6	D	Ipui for handset 6. If set to FF .. FF handset is not enrolled.
0090-009F	??..??	UAK_1	-	UAK for hanset 1
00A0-00AF	??..??	UAK_2	-	UAK for hanset 2
00B0-00BF	??..??	UAK_3	-	UAK for hanset 3
00C0-00CF	??..??	UAK_4	-	UAK for hanset 4
00D0-00DF	??..??	UAK_5	-	UAK for hanset 5
00E0-00EF	??..??	UAK_6	-	UAK for hanset 6

15.3.2. MeterPulse Billing

Address	Default	Name	Type	Description
0140-0141	00 01 MSB LSB	MpBill.Unit	D	Meter-pulse billing unit
0142-0145	00..00	MpBill.PstnLineTotal	D	Meter-pulse billing total for PSTN MSB in 0160h.
0146-0149	00..00	MpBill.Hs1	D	Meter-pulse billing total for HS1
014A-014D	00..00	MpBill.Hs2	D	Meter-pulse billing total for HS2
014E-0152	00..00	MpBill.Hs3	D	Meter-pulse billing total for HS3
0153-0156	00..00	MpBill.Hs4	D	Meter-pulse billing total for HS4
0157-0159	00..00	MpBill.Hs5	D	Meter-pulse billing total for HS5
015A-015D	00..00	MpBill.Hs6	D	Meter-pulse billing total for HS6

15.3.3. Free Block 1

Address	Default	Name	Type	Description
161-162	00..00	RunTimeErrorLogAddress	-	Last RunTime error (uint16)

15.3.4. Audio Setup

Address	Default	Name	Type	Description
0200	0x14	SpeakerGain	D	Gain for speaker output (GX2), see index values
0201	0x11	MicGain	D	Gain for microphone input (GR1), index values
0202 - 0203 MSB - LSB	0x3BCA	GX1Gain	D	Gain for GX1 gaincell, see append for transmit and receive
0204 - 0205 MSB - LSB	0x0110	GR2Gain	D	Gain for GR2 gaincell, see append for transmit and receive.
0206	0x40	ClipperConfig (Lim_Sc)	D	Soft clipping configuration, see DS
0207	0x79	Gain after soft clipping (GX1SC)	D	Soft clipping configuration, see ap Amplification by Shift&Add coeffe
0208	0xD5	OnhookMicGain	D	On-hook gain-settings for analogu Bit 0..5 : GR1, see Gain index valu Bit 6..7 : AIG, 11=6dB 11=6dB, 01=12dB, 10=18dB
0209 - 020B MSB - LSB	-	Reserved	-	
020C	0xBB	GD1Gain	D	Gain for GD1 gaincell (high DTMF see appendix Gain for tonegenera
020D	0x24	GD2Gain	D	Gain for GD2 gaincell (low DTMF t appendix Gain for tonegenerator
020E	0x40	GDRGain	D	Gain for GDR gaincell (DTMF tone handset), see appendix Amplificat Shift&Add coeffecients
020F	0x30	GDXGain	D	Gain for GDX gaincell (DTMF tone see appendix Amplification by Shi coeffecients
0210	2	RingerVolumeStep	D	Current ringer volume selected by
0211	0x00	RingerVolumeData0	D	Volume data for ringer volume ste Range 0-100.
0212	0x0C	RingerVolumeData1	D	Volume data for ringer volume ste Range 0-100.
0213	0x18	RingerVolumeData2	D	Volume data for ringer volume ste Range 0-100.
0214	0x30	RingerVolumeData3	D	Volume data for ringer volume ste Range 0-100.
0215	10	ToneVolumeData	D	Volume data for tone volume. Ran
0216 - 021F	-		-	Reserved for audio parameters
0220 - 0228	-		-	Reserved for audio parameters
0229	0x21	GCR	D	GCR register
022A	0x20	ACR	D	ACR register
022B - 023E	0x00		D	Unused
022F	0x21	SoftLimiter1	D	LIM_HIGHR
0230	0x18	SoftLimiter1	D	LIM_LOWR

Address	Default	Name	Type	Description
0231	0x40	SoftLimiter2	D	LPOR + TIM_OVR
0232	0x21	SoftLimiter2	D	GOR
0233 - 023F	-		-	Reserved for audio parameters

15.3.5. BsNalTask

Address	Default	Name	Type	Description
0240	0x01	ARSCountryCorrespondance	D	ARS Country Correspondance 0 = Negative matching: No area code match -> Carrier is i 1 = Positive matching: Match on area code -> Carrier is ir 2 = French matching: First digit of matched area code is by carrier code
0241	0x00	ARSInternationalPrefix	D	ARS international prefix code in B form: International prefix = 00 Adr 0241 = 0x00
024D - 0250 0251 - 0254 0255 - 0258 0259 - 025C	0x11,0x2F, 0xFF,0xFF 0x11,0x0F, 0xFF,0xFF 0xFF,0xFF, 0xFF,0xFF 0xFF,0xFF, 0xFF,0xFF	BsNalExemptedNumber 1 BsNalExemptedNumber 2 BsNalExemptedNumber 3 BsNalExemptedNumber 4	D	Exempted numbers in BCD on the ExemptedNumber1 = 112 Addr 024D = 0x11 , Addr 024E = 0x Addr 024F = 0xFF , Addr 0250 = 0x
025D	0x00	ARSCheckEnable	D	ARS check configuration 1 = enable, 0 = disable
025E	0x00	ARS Delete International Number	D	ARS delete international number configuration 1 = enable, 0 = disable Also used for enabling/disabling F ARS matching.
0261	0x00	BarredHandsets	D	Barred handsets configuration Bit 0: SpeakerPhone (TCD715/TCD735 1: Handset 1, 2: Handset 2, 3: Han 4: Handset 4, 5: Handset 5, 6: Han

Address	Default	Name	Type	Description
0262 - 0265 0266 - 0269 026A - 026D 026E - 0271 0272 - 0275 0276 - 0279	FF..FF FF..FF FF..FF FF..FF FF..FF FF..FF	BsNalBarredNumber 1 BsNalBarredNumber 2 BsNalBarredNumber 3 BsNalBarredNumber 4 BsNalBarredNumber 5 BsNalBarredNumber 6	D	Barred numbers in BCD on the for Barred number 1 = 1234 Addr 0262 = 0x12 , Addr 0263 = 0x Addr 0264 = 0xFF , Addr 0265 = 0x
027A - 027B 027C - 027D 027E - 027F 0280 - 0281 0282 - 0283 0284 - 0285 0286 - 0287 0288 - 0289	0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF	AKZ AccessCode 1 AKZ AccessCode 2 AKZ AccessCode 3 AKZ AccessCode 4 HAKZ AccessCode 1 HAKZ AccessCode 2 HAKZ AccessCode 3 HAKZ AccessCode 4	D	AccessCodes in BCD on the form: AKZ Code 1 = 12 Addr 027A = 0x12 , Addr 027B = 0x
028A - 028D 028E - 0291 0292 - 0295 0296 - 0299 029A - 029D	FF .. FF FF .. FF FF .. FF FF .. FF FF .. FF	ARSCarrierCode 1 ARSCarrierCode 2 ARSCarrierCode 3 ARSCarrierCode 4 ARSCarrierCode 5	D	ARS Carrier codes in BCD on the f ARS Carrier 1 = 1234 Addr 028A = 0x12 , Addr 028B = 0x Addr 028C = 0xFF , Addr 028D = 0x
029E - 02A0 02A1 - 02A3 ..... 02E6 - 02E8	FF, FF, F1 FF, FF, F1 ..... FF, FF, F1	ARSAreaCode 1 ARSAreaCode 2 ..... ARSAreaCode 25	D	ARS Area codes in BCD on the for ARS Area 1 = 1234 associated witl Carrier 1 Addr 029E = 0x12 , Addr 029F = 0x Addr 02A0 = 0xF1

15.3.6. PSTN Line

Address	Default	Name	Type	Description
0F00	03	UserCfg-1.Mode	D	User configuration (MMI) - mode s Bit 0 : "R" mode, 0=earth break, 1=lo 2..1: Dial mode, 00:pulse, 01:DTM 3..7: Reserved
0F01	0D	UserCfg-2.Mode	D	User configuration (MMI) - mode s Bit 0..1: short "R" key time selection 00= short, 01=long, 10=extra-long 2..3: long "R" key time selection 00= short, 01=long, 10=extra-long, 11=undef (uses same time as spec short R key) 4..7: Reserved Defaults to 0000 1101
0F02	10	UserCfg.RPauseTime	D	User configuration (MMI) - "R"-pau disabled, normal dial pause (DialPauseTime) is used. Bit 7..0 : "R" pause time, zero valu Unit : 50 ms, defaults to 800 ms.
0F03	03	UserCfg.DialPauseTime	D	User configuration (MMI) - dial pau Bit 3-0 : dial pause in 1 sec units , allowed. Bit 7-4 : unused Defaults to 3 seconds

Address	Default	Name	Type	Description
0F04	0F	Cfg-1	D	PSTN line configuration 1 (factory Bit 0: EarthBreakEnable , Earth break 0=disable 1:LoopBreakEnable, Loop break 1 =disable 2:PulseDialEnable, Pulse dial 1=er disable 3:RPauseEnable, usage of "R" pau enable, 0=disable 4:PulseType,0=normal puls-type 1=('0'=1 pils,..'9'=10 puls's). 5: InterDigitLowImp. controls inter impedance. 1: keep low-impedance during int pause 0: normal impedance during inter pause 6: LowImpLineSeizure. Special lov seizure (Australian) , 1=enable , 0= 7: TwoLines. line config 0=one lin lines Defaults to 0000 0111B.
0F05	15	Cfg-2		PSTN line configuration 2 (factory Bit 0: Meter-pulse, 1=enable, 0=disabl 1: DialToneMode, dial tone detecti enable 0=disable 2: BusyToneMode. busy tone dete enable 0=disable 3: CurrentLimiterMode, 1=enable, 4: RingToneMode. Ring tone detec enable 0=disable 5: HookRelayEnable, 1=enable, 0= (if same port is used for earth-con EarthBreakEnable and HookRelay cannot both be set to 1). 6..7: not used Defaults to 0001 0101B.
0F06	28	MakeTime	D	Pulse make time. Unit : 1 ms. defaults to 40 ms.
0F07	3C	BreakTime	D	Pulse break time Unit : 1 ms, defaults to 60 ms.
0F08	64	DtmfTime	D	DTMF tone pulse time. Unit : 1 ms, defaults to 100 ms.
0F09	0A	InterDigitDtmfTime	D	Inter-digit time in DTMF mode. Unit : 10 ms , defaults to 100ms.

Address	Default	Name	Type	Description
0F0A	4A	InterDigitPulseTime	D	Inter-digit time in Pulse mode. Unit : 10 ms, defaults to 740 ms.
0F0B	08	CalibBreakTime[0]	D	Calibrated loop-break time for sho Unit : 10 ms, defaults to 80 ms.
0F0C	14	CalibBreakTime[1]	D	Calibrated loop-break time for lon Unit : 10 ms, defaults to 200 ms.
0F0D	46	CalibBreakTime[2]	D	Calibrated loop-break time for extı break Unit : 10 ms, defaults to 700 ms.
0F0E	28	CalibBreakTime[3]	D	Calibrated earth-break time for sh Unit : 10 ms, defaults to 400 ms.
0F0F	82	CalibBreakTime[4]	D	Calibrated earth-break time for lor Unit : 10 ms, defaults to 1300 ms.
0F10	82	CalibBreakTime[5]	D	Calibrated earth-break time for ext break Unit : 10 ms, defaults to 1300 ms.
0F11	FF	LineSeizureEndTime	D	Line seizure end-time - time after l Meter-pulse detection continues d period of time. 00h or FFh means Unit : 10 ms, defaults to 10 ms.
0F12	64	RingTermToU100	D	Ring terminate time-out period. Th max time that must elapse betwee -voltage bursts before the new rin is registered as a new incoming ca Unit: 100 ms. defaults to approx 1(
0F13	08	RingPatternToU100	D	Ring pattern timeout. Max. silence during distinctive ringing. As long silence period does not exceed thi of time the ring is still considered counted as one single ring. Unit : 100 ms. Defaults to 800 ms
0F14	FF	AgcUpdateTime		Line AGC update time. The period between each line AGC update. If AGC is disabled. If used recomme value is 64h (1 sec). Unit : 10ms, min/max: 10/FF, Defau disabled.
0F15	0A	LineSeizureTime		Line seizure time. The period of tir the PSTN line or the PSTN HW nee the hook-switch is activated in orc ready. During this period audio is Only used during outgoing calls o special-line seizure mode is enabl 6). Unit : 10 ms, min/max: 01/FF. Defa 100 ms.

Address	Default	Name	Type	Description
0F16	66	InitDialPause	D	Init-dial-pause. Dial pause inserte hook-off when making an outgoin Bit 0..3: init dial pause if PULSE di If 0fH then normal dial-pause is us Bit 4..7: init dial pause if DTMF dia 0fH then normal dial-pause is use Unit : 500 ms, min/max: 00/0F. Def sec and 3 sec.
0F17..1BB	FF..FF	Reserved[5]	D	

15.3.7. Clip configration

Address	Default	Name	Type	Description
0F37.. 38	3D 00	Parse.Configuration	D	Clip parse set configuration Bit 0: Etsi: 1=enable 0=disable 1: ForwardNumber: 1=enable 0=di 2: Danish: 1=enable 0=disable 3: Dutch: 1=enable 0=disable 4: Canadian: 1=enable 0=disable 5: Swedish: 1=enable 0=disable 6: UserDefined: 1=enable 0=disabl 7: KPN vmwi: 1=enable 0=disable 8: Reserved8 9: Reserved9 10: Reserved10 11: Reserved11 12: Reserved12 13: Reserved13 14: Reserved14 15: Reserved15

15.3.8. BsUiTask

Address	Default	Name	Type	Description
0FFD	(TCD715 / TCD735 0xFF (TCD700 / TCD705 / TCD725) 0xF7	Config	D	BsUiTask configuration Bits 1=enable 0=disable 0: FlashTime1Enabled. 1: FlashTime2Enabled. 2: FlashTime3Enabled. 3: KeyClicksEnabled: TCD700 / TCD705 / TCD725: Defau disabled TCD715 / TCD735: Defaul 4: ARSCarrierMenuEnabled. 5: ARSIntDeletionMenuEnabled. 6: ARSMultipleCarrierMenuEnable 7: ARSMultipleAreaCodeMenuEna
0FFE	(step6) 0x01 (step5) 0x05	Kamma4BaseModelId	A	Kamma4 Base Model Identifier: 0x01 = TCD7000 0x02 = TCD7050 0x03 = TCD715 0x04 = TCD725 0x05 = TCD735

15.3.9. SP phone setting

Address	Value
0d67	0b
0d68	7f
0d6a	7f
0d6c	fd
0d6d	10
0d6e	40
0d6f	4f
0d70	58
0d71	5f
0d74	50
0d75	10
0d76	60
0d77	10
0d79	40

15.4. Appendix

15.4.1. Gain for transmit and receive

	[dB]		[dB]		[dB]		[dB]		[dB]
00 00	16.06	31 15	5.92	BB 22	2.72	39 20	11.02	48 D7	29.51
00 01	16.9	21 41	5.73	AB 92	2.92	A9 24	11.2	98 C6	29.97
00 02	16.26	0B 93	5.53	3A 15	3.11	98 C2	11.39	C6 D6	30.4
00 03	16.92	12 C3	5.34	BA C0	3.3	39 14	11.58	C6 DE	30.8
00 0D	15.47	21 BB	5.14	AB B5	3.5	A9 22	11.77	B8 E0	31.26
00 0B	15.19	0A 94	4.94	19 35	3.7	9A 0D	11.91	38 E1	31.58
00 11	14.81	0B 41	4.74	AB 31	3.89	99 52	12.39	48 E1	32.08
00 12	14.4	32 10	4.54	2A 10	4.08	C9 15	12.88	A8 D7	32.53
00 1D	13.92	22 23	4.35	AA A5	4.28	99 33	13.36	A8 DD	32.88
00 21	13.53	31 B5	4.16	AA B1	4.47	99 31	13.84	C8 E1	33.16
00 2D	13.03	22 4B	3.97	AA BC	4.66	A8 A5	14.27	48 E2	33.66
00 3C	12.54	22 CC	3.77	AA CA	4.66	99 24	14.72	28 E7	34.12
01 10	12.04	32 21	3.59	B9 A3	5.03	C8 B1	15.1	48 E3	34.57
00 BB	11.55	32 25	3.4	AA 42	5.23	48 B2	15.6	48 E4	35.07
00 B3	11.41	23 30	3.2	AA 33	5.41	28 B7	16.06	48 E7	35.53
00 B2	11.33	23 4A	3.01	39 44	5.5	48 B3	16.51	98 D6	35.99
00 B1	11.19	23 B2	2.81	AA 25	5.78	48 B4	17.01	C8 E5	38.42
01 13	11.04	32 B1	2.63	AA 22	5.96	48 B7	17.47	C8 EE	36.82
00 A5	10.84	1B CB	2.43	B9 B5	6.13	96 A6	17.93	B8 D9	37.28
00 A3	10.72	1B 41	2.24	39 33	6.31	CB B5	18.36	A8 E3	37.6
01 21	10.57	1B 30	2.05	98 93	6.51	C8 BE	18.76	A8 E4	38.1
01 22	10.4	33 B1	1.86	AA 14	6.69	B8 C0	19.22	A8 E7	38.55
01 2D	10.22	33 A1	1.68	9B AD	6.89	38 C1	19.54	A8 ED	38.9
01 31	10.07	33 93	1.49	9B C2	7.06	48 C1	20.03	C8 EA	39.18
01 3C	9.88	1A C1	1.29	9B 42	7.28	A8 B7	20.49	B8 EA	39.78
01 4A	9.68	2B A5	1.09	9B 2C	7.48	A8 B0	20.84	98 E2	40.21
02 0D	9.5	2B C1	0.89	B9 4B	7.67	C8 C1	21.12	98 E3	41.12
10 CB	9.3	2B 44	0.7	A9 C2	7.87	48 C2	21.62	98 E4	41.62
10 C1	9.13	3B 94	0.5	A9 C8	6.06	28 C7	22.06	98 E7	42.06
10 B4	8.95	2B 21	0.3	9A C1	6.25	48 C3	22.53	98 ED	42.42
01 A5	8.76	2B 15	0.11	99 95	8.43	48 C4	23.03	C8 E9	42.7
02 21	8.59	3B CA	0.08	9A 49	8.61	48 C7	23.49	B8 E9	43.3
02 25	8.4	09 49	0.28	9A 41	8.8	98 B6	23.95	A8 E9	44.64
02 33	8.2	3B 24	0.47	B9 31	8.98	C8 C5	24.38	29 0F	46.23
02 49	8.01	1A 14	0.67	9A 2B	9.18	C8 CE	24.78	39 0F	47.14
02 C2	7.82	3B 13	0.86	A9 41	9.37	B8 D0	25.24	49 0F	47.64
02 B1	7.63	3A B2	1.03	A9 38	9.53	38 D1	25.56	98 E9	48.16
20 BC	7.43	2A 2B	1.22	A9 35	9.72	48 D1	26.05	C9 0F	48.73
11 43	7.24	2A 23	1.42	99 A3	9.89	A8 C7	26.51	B9 0F	49.32
03 49	7.07	3A 4A	1.61	B9 23	10.05	AB CD	26.86	A9 0F	50.66
21 14	6.88	09 31	1.8	9A 14	10.21	C8 D1	27.14	99 0F	54.19
11 BD	6.69	BB A4	2	29 15	10.38	48 D2	27.64	88 00	1"10^1(
30 BD	6.5	BB BB	2.19	99 B1	10.55	28 D7	28.1		
12 15	6.31	BB 4A	2.38	29 14	10.66	48 D3	28.55		
21 2C	6.11	BB 31	2.56	A9 2C	10.84	48 D4	29.05		

15.4.2. Gain for tonegenerator

	[dB]		[dB]		[dB]		[dB]		[dB]
00	6.02	1F	-6.09	35	-17.79	51	-26.58	6E	-36.26
01	3.52	1E	-6.16	36	-17.93	52	-28.16	6D	-36.40
02	1.94	1D	-6.30	37	-17.99	53	-29.08	6C	-36.68
03	1.02	1C	-6.58	40	-18.06	54	-29.58	6B	-37.28
04	0.53	1B	-7.18	3F	-18.13	55	-29.84	71	-38.62
05	0.27	21	-8.52	3E	-18.20	56	-29.97	72	-40.21
06	0.13	22	-10.10	3D	-18.34	57	-30.04	73	-41.12
07	0.07	23	-11.02	3C	-18.62	60	-30.10	74	-41.62
10	0.00	24	-11.51	3B	-19.22	5F	-30.17	75	-41.88
0F	-0.07	25	-11.77	41	-20.56	5E	-30.24	76	-42.01
0E	-0.14	26	-11.91	42	-22.14	5D	-30.38	77	-42.08
0D	-0.28	27	-11.97	43	-23.06	5C	-30.66	69	-42.14
0C	-0.56	30	-12.04	44	-23.56	5B	-31.26	7F	-42.21
0B	-1.16	2F	-12.11	45	-23.82	61	-32.60	7E	-42.28
11	-2.50	2E	-12.18	46	-23.95	62	-34.19	7D	-42.42
12	-4.08	2D	-12.32	47	-24.01	63	-35.10	7C	-42.70
13	-5.00	2C	-12.60	50	-24.08	64	-35.60	7B	-43.30
14	-5.49	2B	-13.20	4F	-24.15	65	-35.86	7A	-44.64
15	-5.75	31	-14.54	4E	-24.22	66	-35.99	79	-48.16
16	-5.89	32	-16.12	4D	-24.36	67	-36.06	08	-1*10^1
17	-5.95	33	-17.04	4C	-24.64	70	-36.12		
20	-6.02	34	-17.54	4B	-25.24	6F	-36.19		

15.4.3. Amplification by Shift & Add coeffecients

	[dB]		[dB]		[dB]		[dB]		[dB]
00	6.02	1F	-6.09	35	-17.79	51	-26.58	6E	-36.26
01	3.52	1E	-6.16	36	-17.93	52	-28.16	6D	-36.40
02	1.94	1D	-6.30	37	-17.99	53	-29.08	6C	-36.68
03	1.02	1C	-6.58	40	-18.06	54	-29.58	6B	-37.28
04	0.53	1B	-7.18	3F	-18.13	55	-29.84	71	-38.62
05	0.27	21	-8.52	3E	-18.20	56	-29.97	72	-40.21
06	0.13	22	-10.10	3D	-18.34	57	-30.04	73	-41.12
07	0.07	23	-11.02	3C	-18.62	60	-30.10	74	-41.62
10	0.00	24	-11.51	3B	-19.22	5F	-30.17	75	-41.88
0F	-0.07	25	-11.77	41	-20.56	5E	-30.24	76	-42.01
0E	-0.14	26	-11.91	42	-22.14	5D	-30.38	77	-42.08
0D	-0.28	27	-11.97	43	-23.06	5C	-30.66	69	-42.14
0C	-0.56	30	-12.04	44	-23.56	5B	-31.26	7F	-42.21
0B	-1.16	2F	-12.11	45	-23.82	61	-32.60	7E	-42.28

11	-2.50	2E	-12.18	46	-23.95	62	-34.19	7D	-42.42
12	-4.08	2D	-12.32	47	-24.01	63	-35.10	7C	-42.70
13	-5.00	2C	-12.60	50	-24.08	64	-35.60	7B	-43.30
14	-5.49	2B	-13.20	4F	-24.15	65	-35.86	7A	-44.64
15	-5.75	31	-14.54	4E	-24.22	66	-35.99	79	-48.16
16	-5.89	32	-16.12	4D	-24.36	67	-36.06	08	-1*10*1(
17	-5.95	33	-17.04	4C	-24.64	70	-36.12		
20	-6.02	34	-17.54	4B	-25.24	6F	-36.19		

15.4.4. Gain index values

Index (dec)	Index (hex)	Gain (dB)	DspRam
0	0x00	-21	0xC8C1
1	0x01	-20	0x48C1
2	0x02	-19	0xB8C0
3	0x03	-18	0x98A6
4	0x04	-17	0x48B4
5	0x05	-16	0x28B7
6	0x06	-15	0xC8B1
7	0x07	-14	0x9931
8	0x08	-13	0xC915
9	0x09	-12	0x9A0D
10	0x0a	-11	0x3920
11	0x0b	-10	0xB923
12	0x0c	-9	0xB931
13	0x0d	-8	0xA9CB
14	0x0e	-7	0x9BC2
15	0x0f	-6	0xAA22
16	0x10	-5	0xB9A3
17	0x11	-4	0x2A10
18	0x12	-3	0xAB92
19	0x13	-2	0xBBA4
20	0x14	-1	0x3AB2
21	0x15	0	0x3BCA
22	0x16	+1	0x2BA5
23	0x17	+2	0x1B30
24	0x18	+3	0x234A
25	0x19	+4	0x224B
26	0x1A	+5	0x0A94
27	0x1B	+6	0x3115
28	0x1C	+7	0x0349
29	0x1D	+8	0x0249
30	0x1E	+9	0x10B4

Index (dec)	Index (hex)	Gain (dB)	DspRam
31	0x1F	+10	0x0131
32	0x20	+11	0x0113
33	0x21	+12	0x0110
34	0x22	+13	0x002D
35	0x23	+14	0x001D
36	0x24	+15	0x0011
37	0x25	+16	0x0003
38	0x26	+17	0x0001
39	0x27	+18	0x0000

15.4.5. Speakerphone gain

DspRam	Index	Attenuation
0x02DA	0/0x00	-21 dB
0x0333	1/0x01	-20 dB
0x0397	2/0x02	-19 dB
0x0407	3/0x03	-18 dB
0x0485	4/0x04	-17 dB
0x0512	5/0x05	-16 dB
0x05B0	6/0x06	-15 dB
0x0662	7/0x07	-14 dB
0x072A	8/0x08	-13 dB
0x080A	9/0x09	-12 dB
0x0905	10/0x0a	-11 dB
0x0A1E	11/0x0b	-10 dB
0x0B5B	12/0x0c	-9 dB
0x0CBD	13/0x0d	-8 dB
0x0E4B	14/0x0e	-7 dB
0x100A	15/0x0f	-6 dB
0x11FF	16/0x10	-5 dB
0x1431	17/0x11	-4 dB
0x16A8	18/0x12	-3 dB
0x196C	19/0x13	-2 dB
0x1C86	20/0x14	-1 dB
0x2001	21/0x15	0 dB
0x23E8	22/0x16	+1 dB
0x284A	23/0x17	+2 dB
0x2D35	24/0x18	+3 dB
0x32B9	25/0x19	+4 dB
0x38E9	26/0x1A	+5 dB
0x3FDB	27/0x1B	+6 dB
0x47A6	28/0x1C	+7 dB
0x5064	29/0x1D	+8 dB

DspRam	Index	Attenuation
0x5A33	30/0x1E	+9 dB
0x6534	31/0x1F	+10 dB
0x718E	32/0x20	+11 dB
0x7F69	33/0x21	+12 dB

16. EEPROM LAYOUT (HANDSET)

16.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC2) TCD115 handset. The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the handset e.g. crystal oscillator adjustment at 0000..01, some are set by the user when configuring the handset e.g. ringer volume at 0F38, and some during normal use of the phone e.g. redial memory at 0311..0392.

16.2. Introduction

The handset uses a 32k bit (4096 x 8) serial EEPROM (IC9) for storing volatile parameters. All parameters are set up before the handset the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.
This document lists all default parameters with a short description.
In the tables below values in a range that are similar are not repeated; i.e. Address 00 to 01 contains the value 00 simply means that the value 00 is repeated in all addressee in the range.

Type	Name	Description
D	default	The EEPROM location is preset to the Default value by the eeprom default loader.
A	adjust	The EEPROM location is set during the production test and should not be overwritten. The value is set by the eeprom default loader only if the location contains 0xFF, i, e. it has never been set.
-		EEPROM location which is not set at all.

16.3. EEPROM contents

16.3.1. General Setup

Address	Default	Name	Type	Description
00-01	?? ??	EepromOscillator	D	Frequency adjustment.....
0002	20	ModulationDeviation	A	Mudulation adjustment
0003	00	Initial Testmode	D	Used when entering testmode
0030-0034	00 .. 00	IPEI	A	IPEI
0036-003A	?? .. ??	PARK_1	-	PARK for registration 1
003B-003F	?? .. ??	PARK_2	-	PARK for registration 2
0040-0044	?? .. ??	PARK_3	-	PARK for registration 3
0045-0049	?? .. ??	PARK_4	-	PARK for registration 4
004A	FF	PLI_1	D	Pli for registration 1. If set to FF t registration is deleted.
004B	FF	PLI_2	D	Pli for registration 2. If set to FF t registration is deleted.
004C	FF	PLI_3	D	Pli for registration 3. If set to FF t registration is deleted.
004D	FF	PLI_4	D	Pli for registration 4. If set to FF t registration is deleted.
0100-0104	?? .. ??	RFPI_1	-	RFPI for registration 1
0105	??	SerClass_1	-	Service class for registration 1
0106	??	LAL_1	-	Location area level for registratic
0107	??	IPUI_LEN_1	-	IPUI length for registration 1
0108-0114	?? .. ??	IPUI_1	-	IPUI for registration 1
0115	??	ZAP_1	-	ZAP for registration 1
0116	??	STATUS_1	-	Status for registration 1
0117-0126	?? .. ??	UAK_1	-	UAK for registration 1
0127-012F	?? .. ??	Reserved	-	Protocol data
0130-0134	?? .. ??	RFPI_2	-	RFPI for registration 2
0135	??	SerClass_2	-	Service class for registration 2
0136	??	LAL_2	-	Location area level for registratic
0137	??	IPUI_LEN_2	-	IPUI length for registration 2
0138-0144	?? .. ??	IPUI_2	-	IPUI for registration 2
0145	??	ZAP_2	-	ZAP for registration 2
0146	??	STATUS_2	-	Status for registration 2
0147-0156	?? .. ??	UAK_2	-	UAK for registration 2
0157-015F	?? .. ??	Reserved	-	Protocol data
0160-0164	?? .. ??	RFPI_3	-	RFPI for registration 3
0165	??	SerClass_3	-	Service class for registration 3
0166	??	LAL_3	-	Location area level for registratic
0167	??	IPUI_LEN_3	-	IPUI length for registration 3
0168-0174	?? .. ??	IPUI_3	-	IPUI for registration 3
0175	??	ZAP_3	-	ZAP for registration 3

Address	Default	Name	Type	Description
0176	??	STATUS_3	-	Status for registration 3
0177-0186	?? .. ??	UAK_3	-	UAK for registration 3
0187-018F	?? .. ??	Reserved	-	Protocol data
0190-0194	?? .. ??	RFPI_4	-	RFPI for registration 4
0195	??	SerClass_4	-	Service class for registration 4
0196	??	LAL_4	-	Location area level for registratic
0197	??	IPUI_LEN_4	-	IPUI length for registration 4
0198-01A4	?? .. ??	IPUI_4	-	IPUI for registration 4
01A5	??	ZAP_4	-	ZAP for registration 4
01A6	??	STATUS_4	-	Status for registration 4
01A7-01B6	?? .. ??	UAK_4	-	UAK for registration 4
01B7-01FF	?? .. ??	Reserved	-	Protocol data

16.3.2. MMI parameters

Address	Default	Name	Type	Description
200-20C	204 = 00	DirectCallEntry	D	The first byte is the length of the speeddialnumber. The next 12 bytes is the 24 digits digit is 4 bytes and stored in BCD + some characters.
20D-28E	--	Redial	D	
28F	00	LastRedialEntry	D	
290 - 299	FF	HotKey	D	index 0 - speeddialentry for key (index 1 - speeddialentry for key 1 - index 9 - speeddialentry for key 9
29A - 29B	00 00	HSPinCode	-	4 BCD Digits
29C	00	EESubscriptionNumber	D	Selected subscription
29D-2A4	00	EESubscriptionInfo	D	HandsetNumber And BaseType f subscriptions.
2A5-2A6	FF FF	AlarmTime	D	4 BCD Digits Hours Tens,Units : Tens,Units
2A7	00	AlarmConfig	D	bit1 + bit2 - Configuration setting alarm. 1 Byte 00 - OFF 01 - ONCE 10 - DAILY.
2A8-2AB	00	TotalHandsetCharge	D	Holds the chargecostcount since handset-reset or callcost-reset(32bit).

Address	Default	Name	Type	Description
2AC	11	FactoryLanguageSetting	D	Factory setting for language: 00 = Spanish 01 = Norwegian 02 = French 03 = Italian 04 = Danish 05 = Dutch 06 = Swedish 07 = Finnish 08 = Greek 09 = Turkish 0A = Hungarian 0B = Portugese 0C = Russian 0D = Polish 0E = Slovakian 0F = Czech 10 = German 11 = English
2AD	11	Language	D	Language code (see table above)
2AE - 2B0	FF FF FF	AvailableLanguages	D	Bit 0: 0:Disable, 1:Enable Spanis Bit 1: 0:Disable, 1:Enable Norwe Bit 2: 0:Disable, 1:Enable French Bit 3: 0:Disable, 1:Enable Italian Bit 4: 0:Disable, 1:Enable Danish Bit 5: 0:Disable, 1:Enable Dutch Bit 6: 0:Disable, 1:Enable Swedis Bit 7: 0:Disable, 1:Enable Finnish Bit 0: 0:Disable, 1:Enable Greek Bit 1: 0:Disable, 1:Enable Turkish Bit 2: 0:Disable, 1:Enable Hungar Bit 3: 0:Disable, 1:Enable Portug Bit 4: 0:Disable, 1:Enable Russia Bit 5: 0:Disable, 1:Enable Polish Bit 6: 0:Disable, 1:Enable Slovak Bit 7: 0:Disable, 1:Enable Czech Bit 0: 0:Disable, 1:Enable Germa Bit 1: 0:Disable, 1:Enable Englis Bit 2-7: Reserved
2B1-2BA	0x41	Category	D	
2BB	00	RunTimeErrorLogConfig	D	00 = Show RunTimeErrorLog dis
2BC-2BD	0000	RunTimeErrorLogAddress	D	0000 = No error.

16.3.3. Audiosettings

Address	Default	Name	Type	Description
345	01	ExtMelodyIndex	D	Melody played when incoming ex call
346	01	IntMelodyIndex	D	Melody played when incoming in call
347	01	PageMelodyIndex	D	Melody played when paging
348	01	AlarmMelodyIndex	D	Melody played when alarm is sou
349	03	EERingerVolume	D	Volume of the ringer
34A	02	EEVoiceVolume	D	Volume of the earpice
34B	03	EESpVolume	D	Volume of the speakerphone
34C	02	EETAMVoiceVolume	D	Volume of the earpice when in TA
34D	03	EETAMSpPhVolume	D	Volume of the speakerphone wh TAM

16.3.4. Melodies

Address	Default	Name	Type	Description
34E - 377	--	MelodyTable	-	Table telling start of each melody of last melody (21 * 2 byte)
378 - 777	--	Melodies	-	Ringermelodies

16.3.5. MMI

Address	Default	Name	Type	Description
778-1EE7	Number Length = 00	PhoneBook	-	200 Phonebook entries, with eac location defined by 30 bytes: Name[MAX_NAME_LENGTH] = 1 NumberLength = 1 byte Number[MAX_NUMBER_LENGTH bytes Category = 1 bytes
1EE8	01	AutoRedial Configuration	D	Bit 0: 0:Disable, 1:Enable Bit1-7: Reserved
1EE9	28	AutoRedial RetryTimeout	D	Timeout between auto redial atte Unit: 1 second. Defaults to 40 seconds.
1EEA	0C	AutoRedial RetryCount	D	Maximum number of auto redial attempts Defaults to 12.
1EEB	00	AudibleRinger	D	

Address	Default	Name	Type	Description
1EEC	08	DisplayContrast	D	Display contrast value[00..1F] wi the highest contrast setting
1EED	02	BacklightColour	D	00 = Off 01 = Red 02 = Green 03 = Orange
1EEE	00	PhbNoOfUsedLocEeprom	D	Number of used locations in Phc
1EEF	00	PhbSortListChecksumHigh	D	High byte of sorted list checksur Phonebook
1EF0	00	PhbSortListChecksumLow	D	Low byte of sorted list checksun Phonebook
1EF1	00	PhbSortListFlag	D	Byte used as a flag in the Phonel
1EF2	01	AlphabetKeyMode	D	Stored keyboard alphabet mode Default to Alphabet (“ABC”)

16.3.6. MMI Bits

Address	Default	Name	Type	Description
1F00	0B	EEToneConfig	D	bit 0 - Keytone on/off - 1/0 bit 1 - Call waiting on/off - 1/0 bit 2 - Range alarm on/off - 1/0 bit 3 - Battery low alarm on/off - 1
1F01	C6	UIConfig00	D	bit 0 - Direct call 1 = on /0 = off bit 1 - StandbyDisplay00 00 = Off Clock bit 2 - StandbyDisplay01 10 = Ppl FpNo bit 3 - BatteryType 1 = Ni-Cd/0 = I bit 4 - Call barring bit 5 - Autio talk bit 6 - TalkmodeDisplay00 11 = T bit 7 - TalkmodeDisplay01 01 = T 10 = Phone number

16.3.7. VolumeSettings

Address	Default	Name	Type	Description
1F12	10	BeepVolSetting	D	Soundlevel of buzzerbeeps, who affected by the ringervolume. Hightime = Cycle/VolumeLevel

nb. There is no restriction in range. That is if a value is put in, who is too high, the hightime will

become zero and therefore onlly clickingsounds will be heard.

16.3.8. Audiogains

Address	Default	Name	Type	Description
1F1D	16	GX-index	D	Gain-transmit (values ranging fr to 0x24, each step representing 1 dB)
1F1E	1C	GR-index	D	Gain-receive (values ranging fro to 0x24, each step representing 1 dB)
1F1F	04	SideToneGain	D	SideToneGain (T67DSP-PPV2xD4 table 1.10).
1F20	11	SpPhGX-index	D	Gain-transmit for speakerphone ranging from 0x00 to 0x24, each step representing 1 dB)
1F21	98	SpPhGR-index	D	Bit7 - AOG when speakerphone (default) Bit6 - AOG2 when speakerphone default) Bit5 - Extra 6dB attenuation usin method described on page 120 in ""T672 XV01D7-7600". 0 = 0dB, 1 = -6dB, when speaker as default) Gain-receive for speakerphone (ranging from 0x00 to 0x1F, each step representing 1 dB)
1F22	08	SpPhSideToneGain	D	SideToneGaint for speakerphone (T67DSP-PPV2xD4-7600, table 1.
1F23	01	SpPhEnableState	D	Indicates in what state the chip-e on HF-AM1 has to be to enable the speakerp amplifier 0x01 - P0.7(SP_AMP) set to high HF_AM1 0x00 - P0.7(SP_AMP) set to low e HF_AM1

Address	Default	Name	Type	Description
1F24	16	HeadsetGX-index	D	Gain-transmit when headset mou (values ranging from 0x00 to 0x24, each representing 1 dB)
1F25	1B	HeadsetGR-index	D	Gain-receive when headset mou (values ranging from 0x00 to 0x24, each representing 1 dB)
1F26	04	HeadsetSideToneGain	D	SideToneGaint when headset mo (T67DSP-PPV2xD4-7600, table 1.
1F27	20	HeadsetDetectVoltage	D	Determines at which voltage bel which the headset will be detected. HeadsetDetectVoltage[eeprom] = steps] = LowVoltage[mV] / (3.2 * 9.53[mV/

16.3.9. Call cost-configuration

Address	Default	Name	Type	Description
1F30	02	MenusEnabled	D	Used to disable/enable functiona bit 0: Callcost - 0 disabled/1 enal bit1: Batteryselection - 0 disable enabled.

16.3.10. Phonebook-FAT

Address	Default	Name	Type	Description
1F31-1FF8	FF	SortedListEeprom	-	Sorted list used in phonebook

17. SCHEMATIC DIAGRAM (BASE UNIT)

17.1. Main

17.2. Keypad

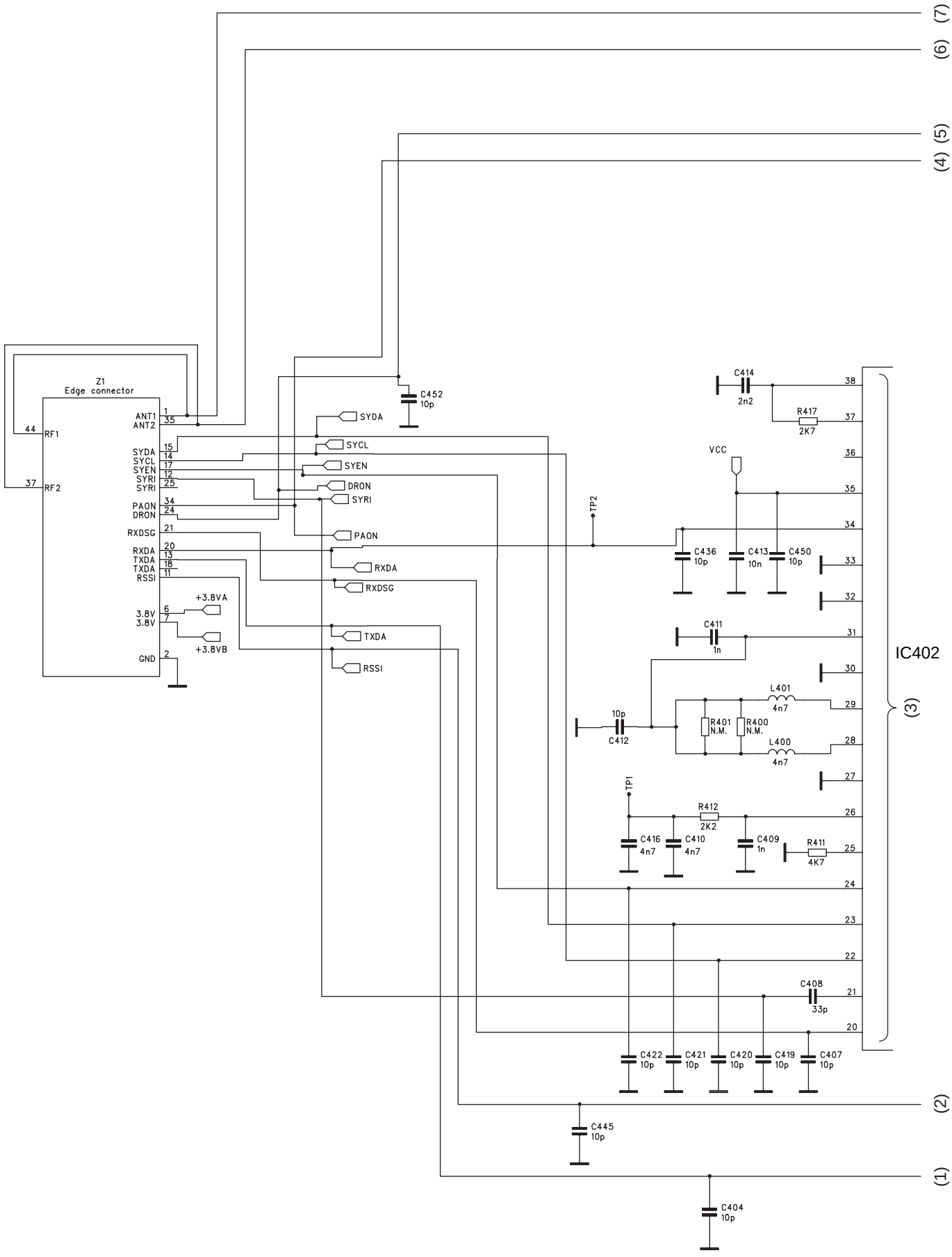
17.3. MEMO

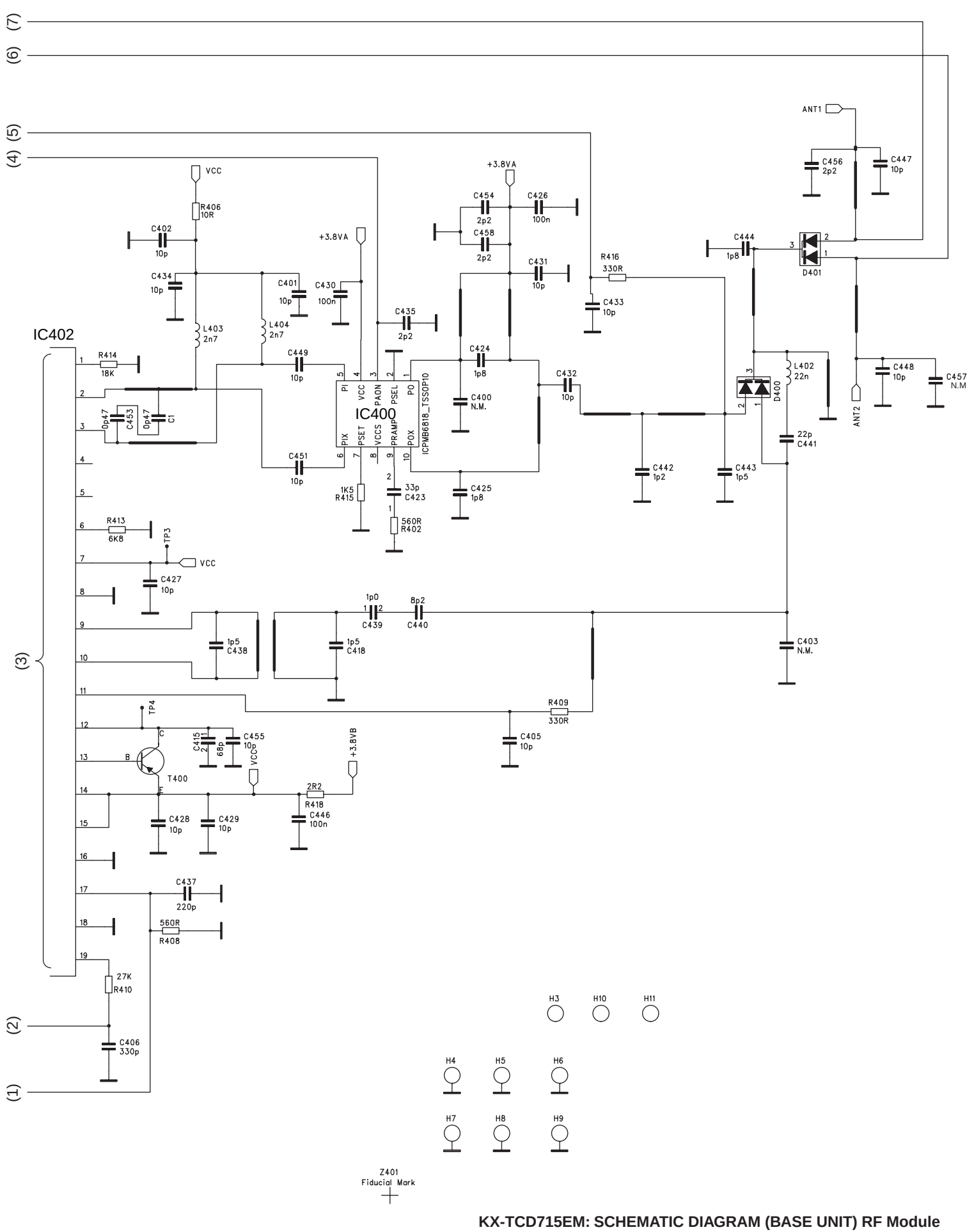
17.4. RF Module

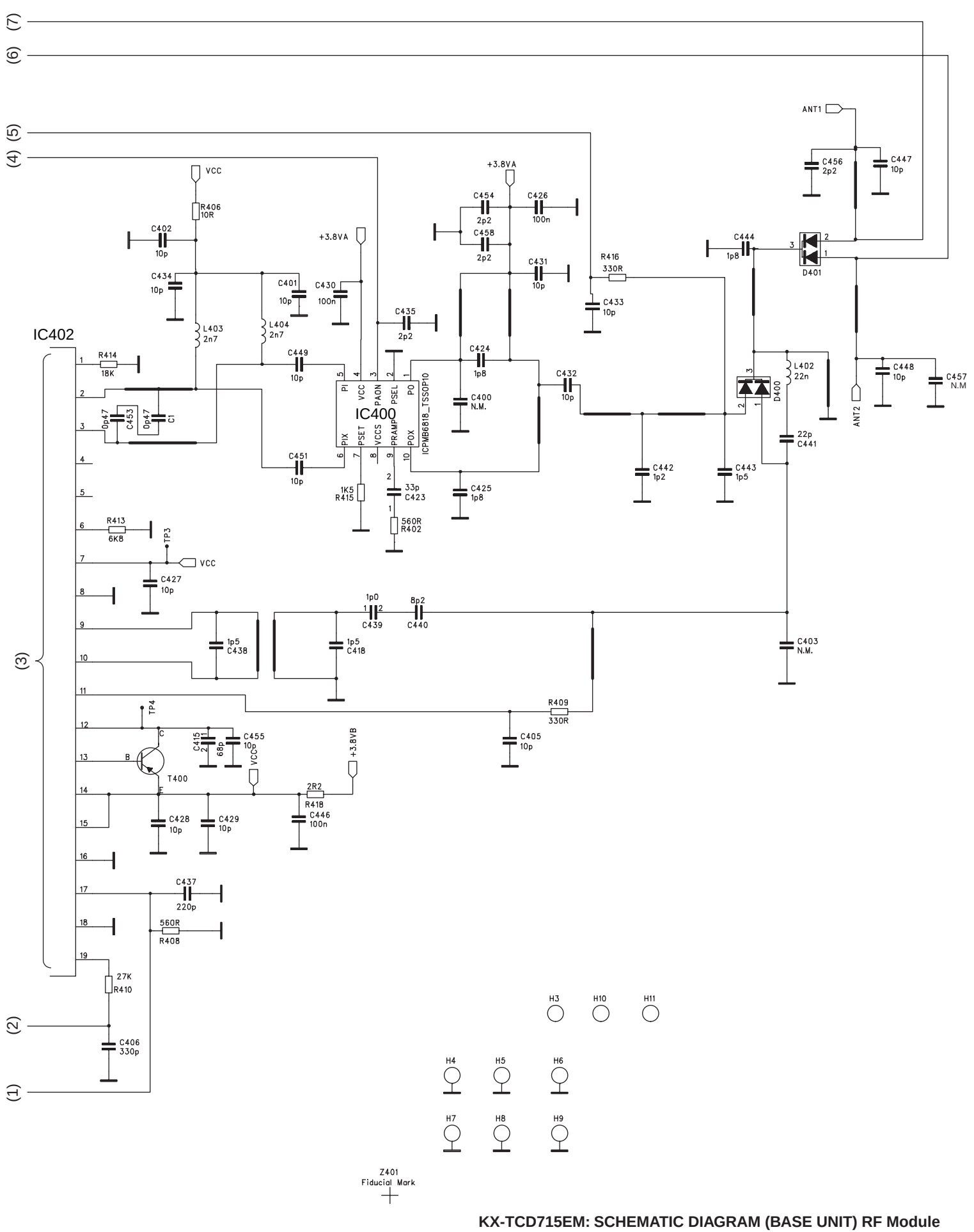
18. SCHEMATIC DIAGRAM (HANDSET)

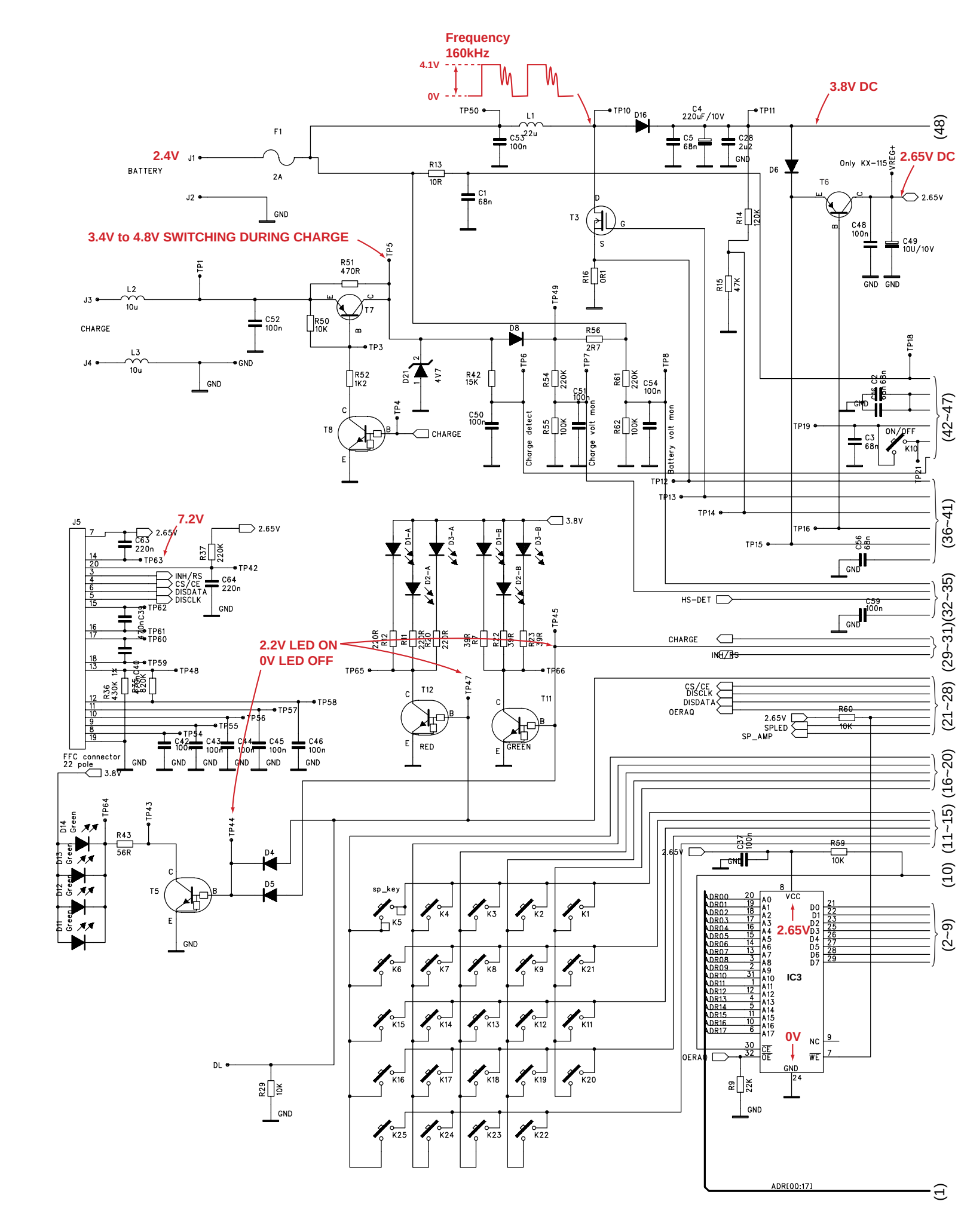
18.1. Main

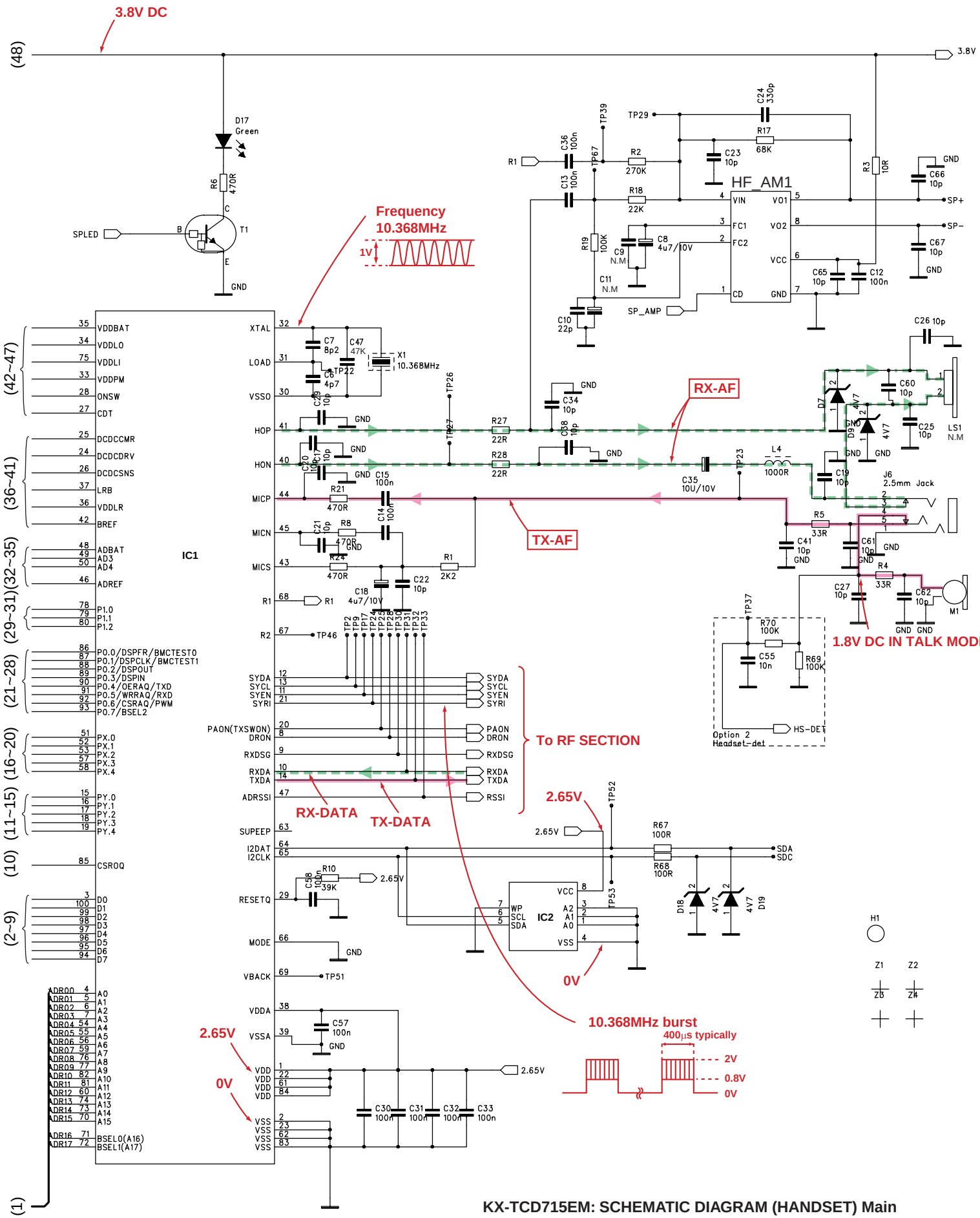
18.2. RF Section
18.3. MEMO
19. CIRCUIT BOARD (BASE UNIT)
19.1. Main (Component View)
19.2. Main (Flow Solder Side View)
19.3. Keypad (Component View)
19.4. Keypad (Flow Solder Side View)
19.5. MEMO
20. CIRCUIT BOARD (HANDSET)
20.1. Main (Component View)
20.2. Main (Flow Solder Side View)


Z1
Edge connector
ANT1
ANT2
RF1
RF2
SYDA
SYCL
SYEN
SYRI
PAON
DRON
RXDSG
RXDA
TXDA
RSSI
3.8V
3.8V
GND
+3.8VA
+3.8VB
C452
10p
C414
2n2
R417
2K7
VCC
C436
10p
C413
10n
C450
10p
TP2
C411
1n
L401
4n7
L400
4n7
R401
N.M.
R400
N.M.
C412
10p
TP1
R412
2K2
C416
4n7
C410
4n7
C409
1n
R411
4K7
C408
33p
C422
10p
C421
10p
C420
10p
C419
10p
C407
10p
C445
10p
C404
10p
IC402
(1)
(2)
(3)
(4)
(5)
(6)
(7)

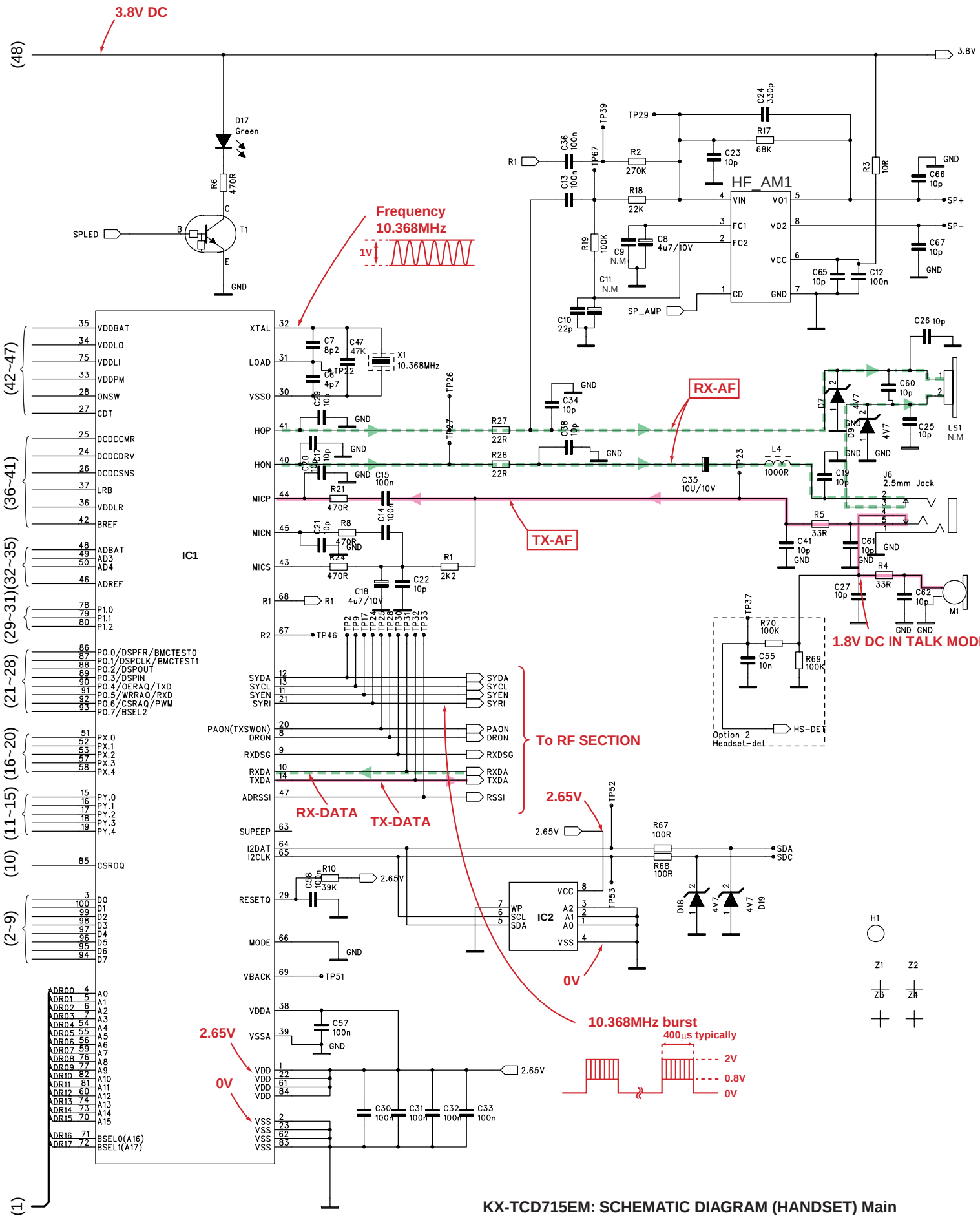

IC402
IC400
ICPWB6818_TSSOP10
PI
VCC
PAON
PSEL
PO
PIX
PSET
VCCS
PRAMP
POX
VCC
+3.8VA
+3.8VB
ANT1
ANT2
D401
D400
T400
TP3
TP4
R406 10R
C402 10p
C434 10p
C401 10p
C430 100n
L403 2n7
L404 2n7
C435 2p2
C454 2p2
C458 2p2
C426 100n
C431 10p
R416 330R
C433 10p
C456 2p2
C447 10p
C444 1p8
L402 22n
C448 10p
C457 N.M
C424 1p8
C400 N.M.
C432 10p
C442 1p2
C443 1p5
22p C441
C403 N.M.
R414 18K
C449 10p
C451 10p
Dp47 C453
Dp47 C1
1K5 R415
33p C423
560R R402
C425 1p8
R413 6K8
C427 10p
1p0 C439
8p2 C440
1p5 C438
1p5 C418
R409 330R
C405 10p
C415 2p2
68p
C455 10p
2R2 R418
C446 100n
C428 10p
C429 10p
C437 220p
560R R408
27K R410
C406 330p
H3
H10
H11
H4
H5
H6
H7
H8
H9
Z401
Fiducial Mark
(1)
(2)
(3)
(4)
(5)
(6)
(7)


IC402
IC400
ICPWB6818_TSSOP10
PI
VCC
PAON
PSEL
PO
PIX
PSET
VCCS
PRAMP
POX
VCC
+3.8VA
+3.8VB
ANT1
ANT2
D401
D400
T400
TP3
TP4
R406 10R
C402 10p
C434 10p
C401 10p
C430 100n
L403 2n7
L404 2n7
C435 2p2
C454 2p2
C458 2p2
C426 100n
C431 10p
R416 330R
C433 10p
C456 2p2
C447 10p
C444 1p8
L402 22n
C448 10p
C457 N.M
C424 1p8
C400 N.M.
C432 10p
C442 1p2
C443 1p5
22p C441
C403 N.M.
R414 18K
C449 10p
C451 10p
Dp47 C453
Dp47 C1
1K5 R415
33p C423
560R R402
C425 1p8
R413 6K8
C427 10p
1p0 C439
8p2 C440
1p5 C438
1p5 C418
R409 330R
C405 10p
C415 2p2
68p
C455 10p
2R2 R418
C446 100n
C428 10p
C429 10p
C437 220p
560R R408
27K R410
C406 330p
H3
H10
H11
H4
H5
H6
H7
H8
H9
Z401
Fiducial Mark
(1)
(2)
(3)
(4)
(5)
(6)
(7)

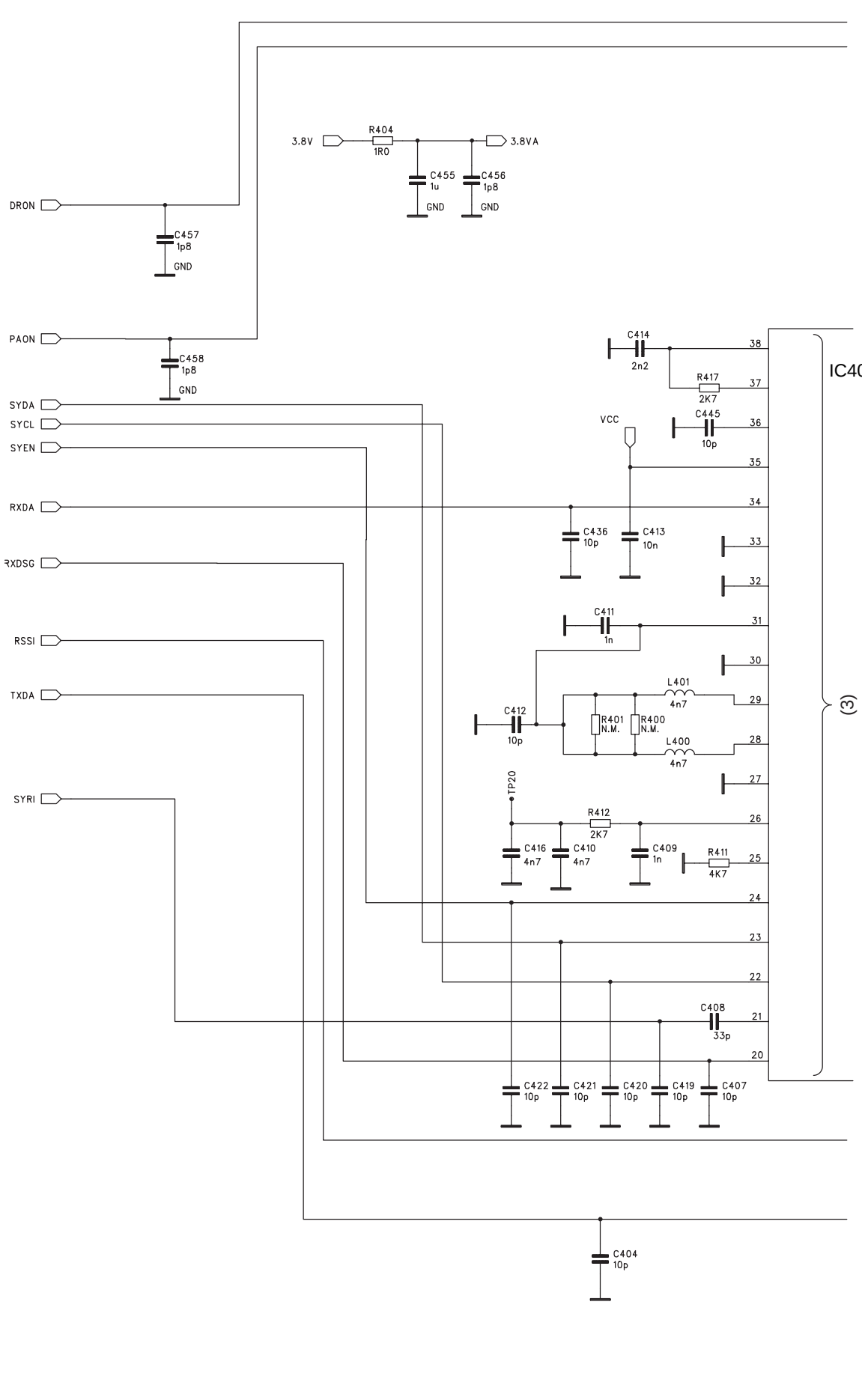

Frequency
160kHz
4.1V
0V
3.8V DC
2.4V
BATTERY
J1
F1
2A
J2
GND
TP50
L1
22u
C53
100n
TP10
D16
C4
220uF/10V
C5
68n
C28
2u2
TP11
(48)
R13
10R
C1
68n
D6
Only KX-115
VREG+
2.65V DC
T6
2.65V
C48
100n
C49
10U/10V
3.4V to 4.8V SWITCHING DURING CHARGE
T3
R14
120K
R15
47K
R16
0R1
TP5
R51
470R
TP1
J3
L2
10u
CHARGE
C52
100n
R50
10K
T7
TP3
J4
L3
10u
TP49
D8
R56
2R7
R52
1K2
D21
4V7
R42
15K
TP6
R54
220K
TP7
R61
220K
TP8
C54
100n
C50
100n
R55
100K
C51
100n
R62
100K
Charge detect
Charge volt mon
Battery volt mon
T8
TP4
CHARGE
TP18
C2
68n
TP19
C3
68n
ON/OFF
K10
TP21
(42~47)
TP12
TP13
TP14
TP16
TP15
C56
68n
(36~41)
7.2V
J5
2.65V
C63
220n
TP63
R37
220K
TP42
C64
220n
INH/RS
CS/CE
DISDATA
DISCLK
TP62
C39
470n
TP61
TP60
C40
820K
TP59
TP48
R36
430K
R35
820K
TP58
TP57
TP56
TP55
TP54
C42
100n
C43
100n
C44
100n
C45
100n
C46
100n
FFC connector
22 pole
3.8V
HS-DET
C59
100n
(29~31)(32~35)
3.8V
D1-A
D2-A
D3-A
D1-B
D2-B
D3-B
2.2V LED ON
0V LED OFF
R12
R11
R10
R9
R8
R7
R22
R23
TP45
CHARGE
INH/RS
TP65
TP66
TP47
T12
T11
RED
GREEN
CS/CE
DISCLK
DISDATA
OERAQ
2.65V
SPLED
SP_AMP
R60
10K
(21~28)
(16~20)
D14
Green
D13
Green
D12
Green
D11
Green
TP64
R43
56R
TP43
TP44
T5
D4
D5
(11~15)
2.65V
C37
100n
R59
10K
(10)
sp_key
K5
K4
K3
K2
K1
K6
K7
K8
K9
K21
K15
K14
K13
K12
K11
K16
K17
K18
K19
K20
K25
K24
K23
K22
DL
R29
10K
IC3
VCC
2.65V
0V
GND
ADR00
ADR01
ADR02
ADR03
ADR04
ADR05
ADR06
ADR07
ADR08
ADR09
ADR10
ADR11
ADR12
ADR13
ADR14
ADR15
ADR16
ADR17
D0
D1
D2
D3
D4
D5
D6
D7
NC
WE
CE
OE
OERAQ
R9
22K
(2~9)
ADR[00:17]
(1)

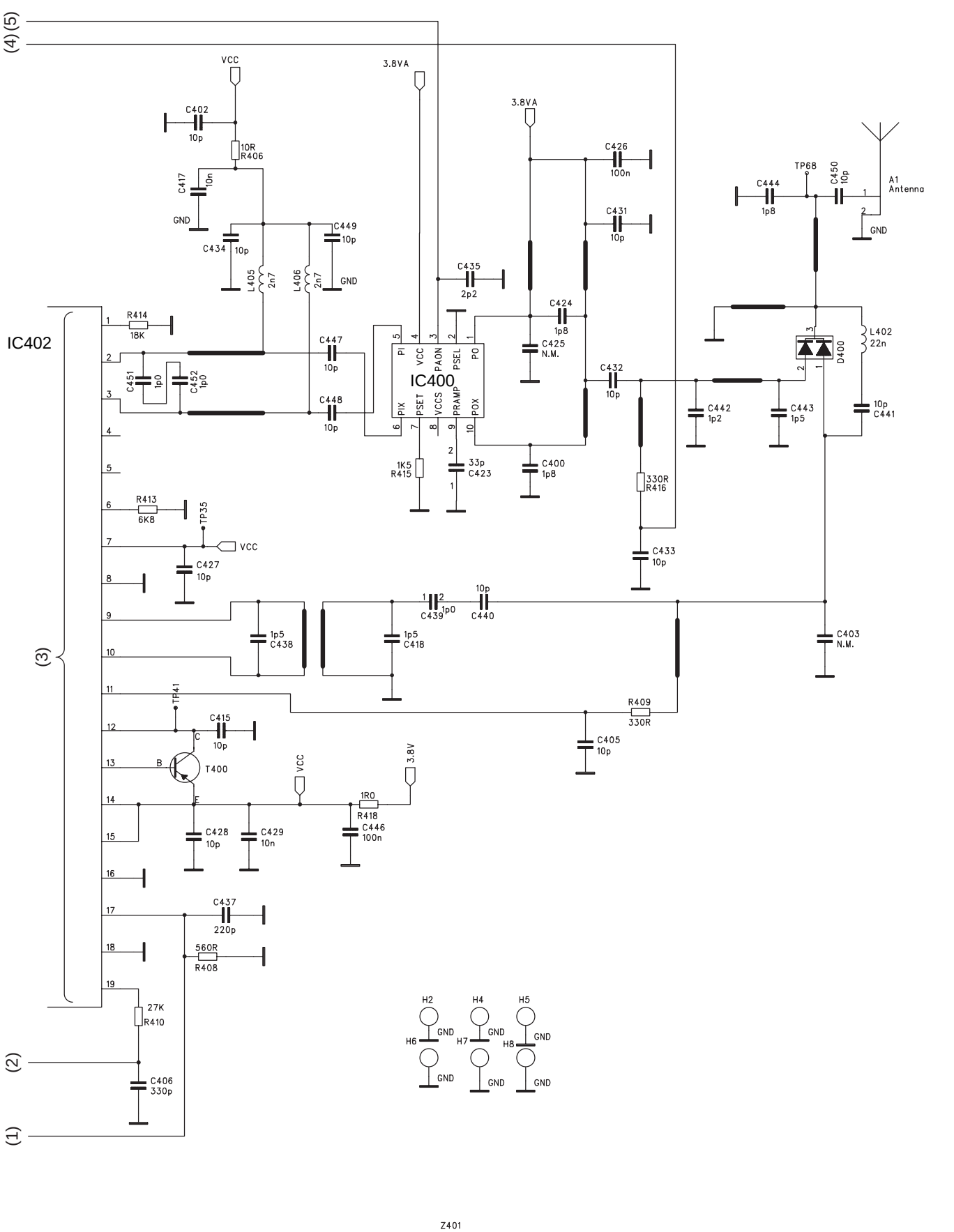


KX-TCD715EM: SCHEMATIC DIAGRAM (HANDSET) Main

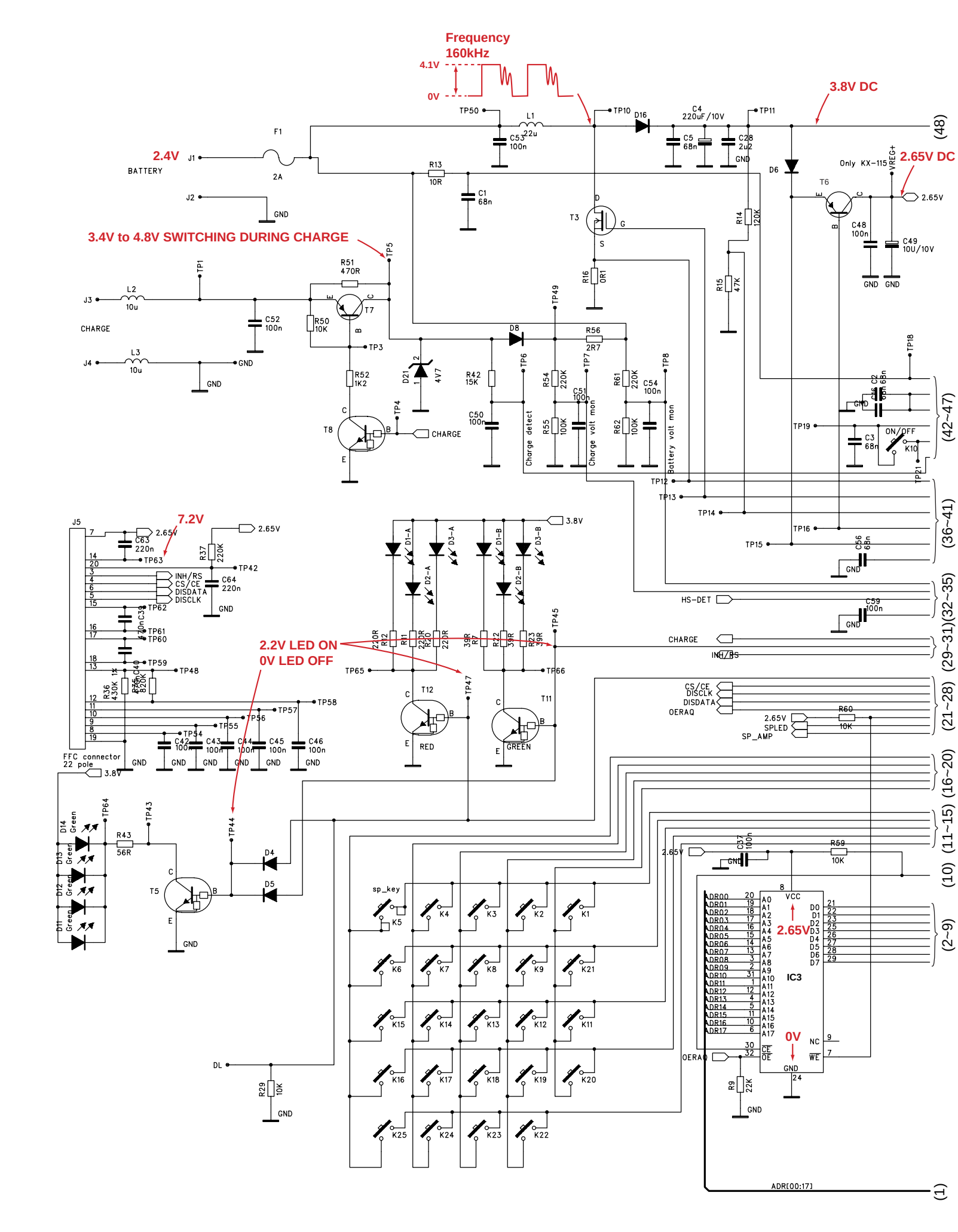


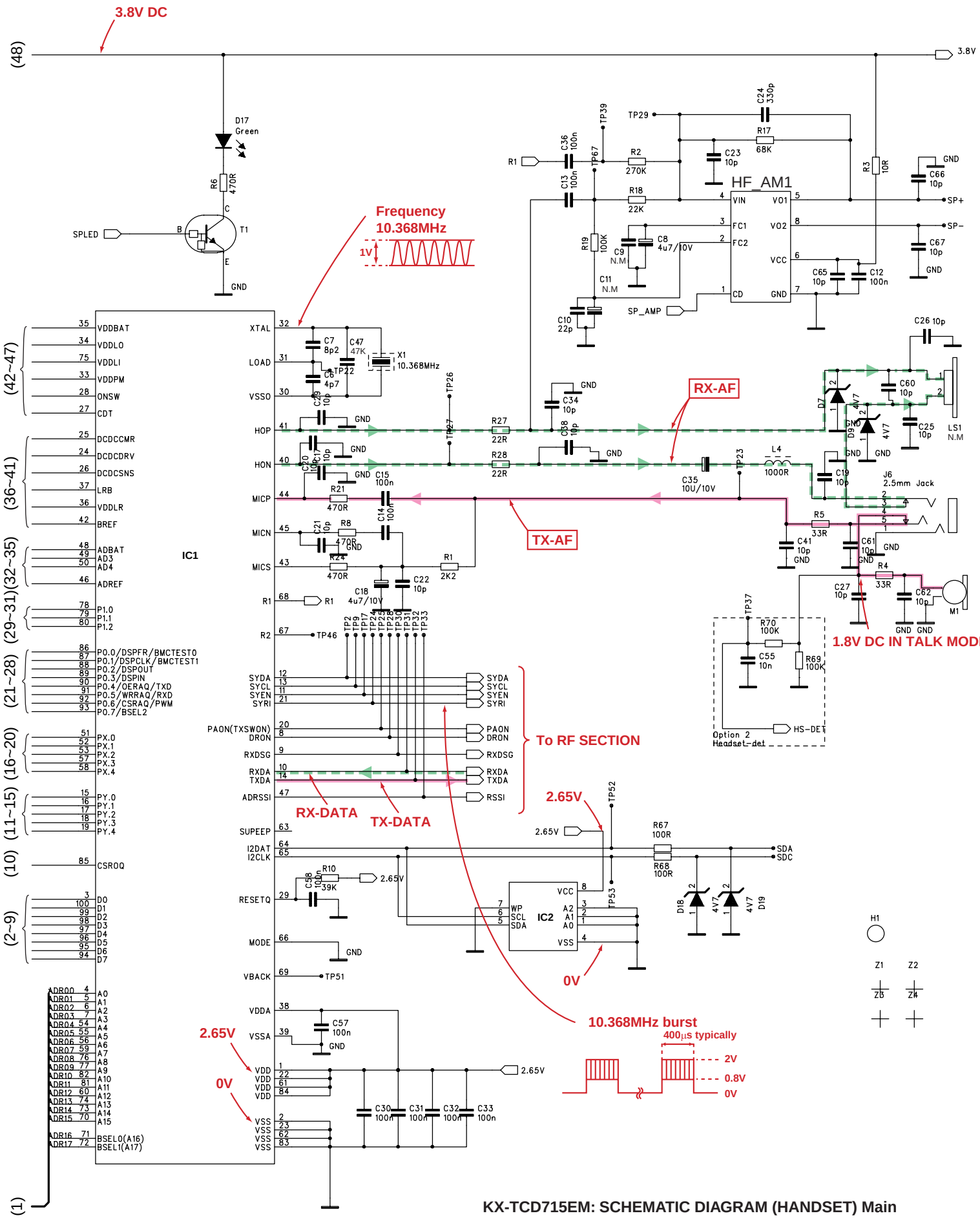
KX-TCD715EM: SCHEMATIC DIAGRAM (HANDSET) Main


(4)(5)
3.8V
R404
1R0
3.8VA
C455
1u
GND
C456
1p8
GND
DRON
C457
1p8
GND
PAON
C458
1p8
GND
SYDA
SYCL
SYEN
RXDA
RXDSG
RSSI
TXDA
SYRI
C414
2n2
38
R417
2K7
37
VCC
C445
10p
36
35
34
C436
10p
C413
10n
33
32
C411
1n
31
30
L401
4n7
29
C412
10p
R401
N.M.
R400
N.M.
L400
4n7
28
27
TP20
R412
2K7
26
C416
4n7
C410
4n7
C409
1n
R411
4K7
25
24
23
22
C408
33p
21
20
C422
10p
C421
10p
C420
10p
C419
10p
C407
10p
IC402
(3)
(2)
(1)
C404
10p

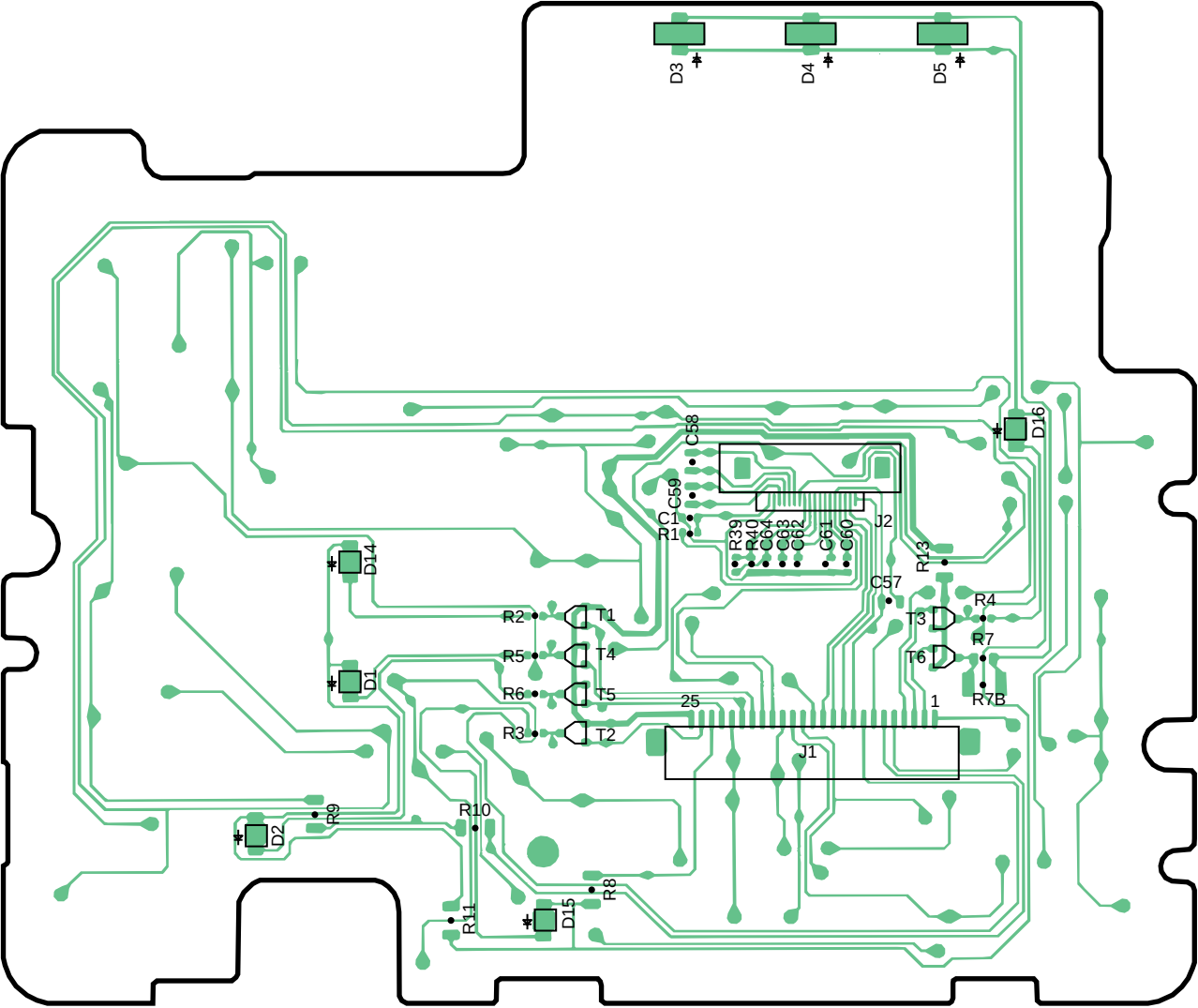


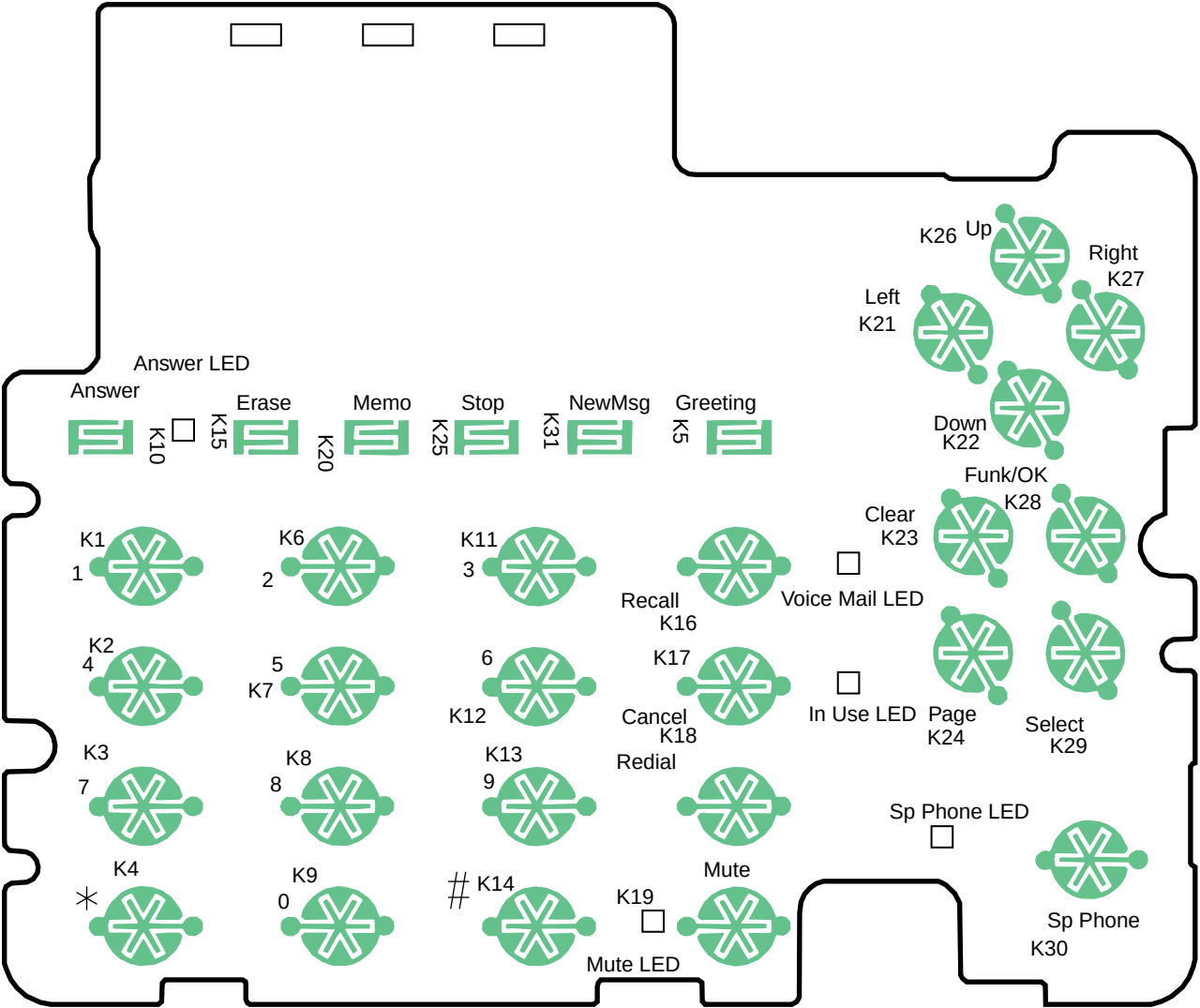
KX-TCD715EM: SCHEMATIC DIAGRAM (HANDSET) RF Section

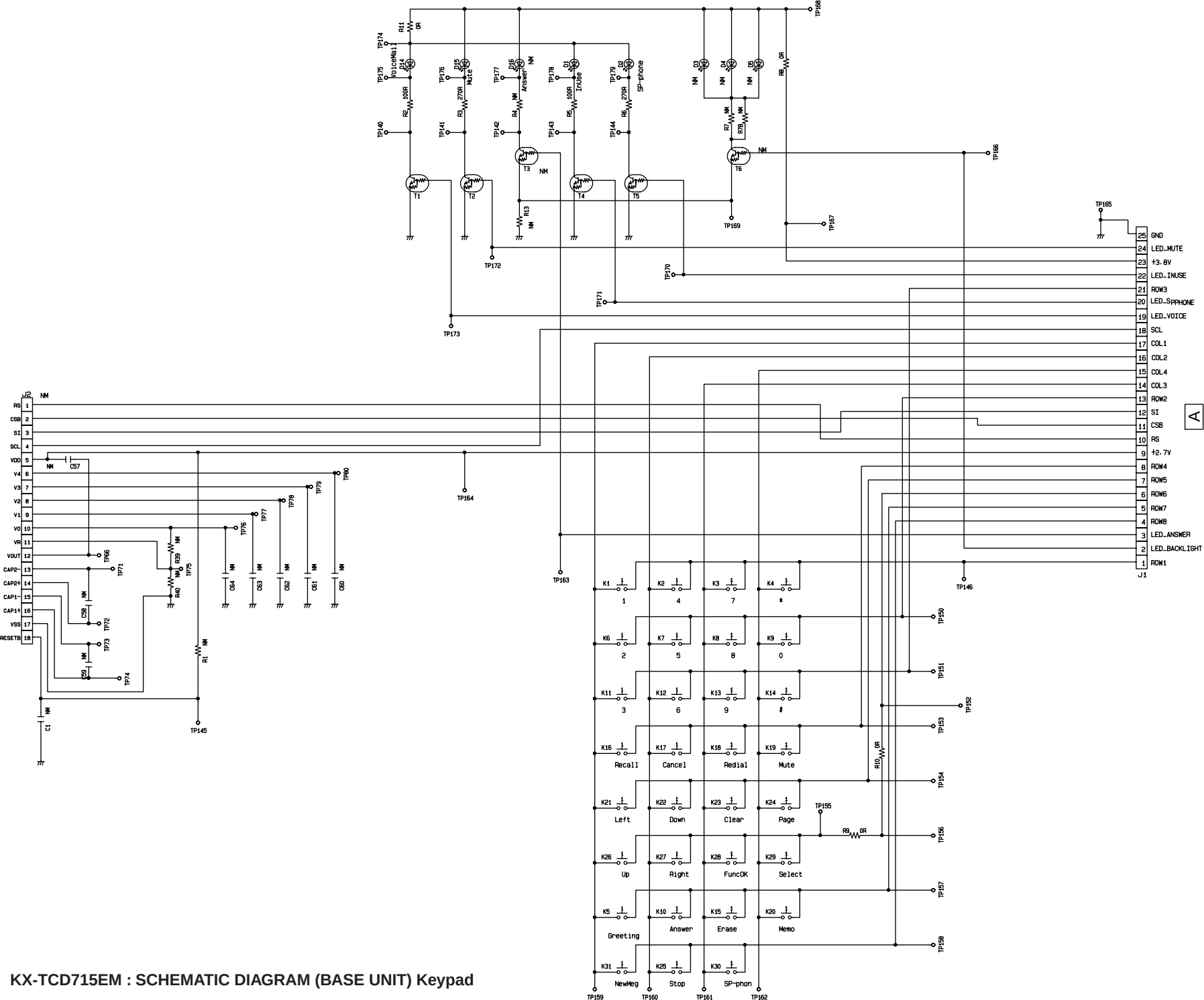

Frequency
160kHz
4.1V
0V
3.8V DC
2.4V
BATTERY
J1
F1
2A
J2
GND
TP50
L1
22u
C53
100n
TP10
D16
C4
220uF/10V
C5
68n
C28
2u2
TP11
(48)
R13
10R
C1
68n
D6
Only KX-115
VREG+
2.65V DC
T6
2.65V
C48
100n
C49
10U/10V
3.4V to 4.8V SWITCHING DURING CHARGE
T3
R14
120K
R15
47K
R16
0R1
TP5
R51
470R
TP1
J3
L2
10u
CHARGE
C52
100n
R50
10K
T7
TP3
J4
L3
10u
TP49
D8
R56
2R7
R52
1K2
D21
4V7
R42
15K
TP6
R54
220K
TP7
R61
220K
TP8
C54
100n
C50
100n
R55
100K
C51
100n
R62
100K
Charge detect
Charge volt mon
Battery volt mon
T8
TP4
CHARGE
TP18
C2
68n
TP19
C3
68n
ON/OFF
K10
TP21
(42~47)
TP12
TP13
TP14
TP16
TP15
C56
68n
(36~41)
7.2V
J5
2.65V
C63
220n
TP63
R37
220K
TP42
C64
220n
INH/RS
CS/CE
DISDATA
DISCLK
TP62
C39
470n
TP61
TP60
C40
820K
TP59
TP48
R36
430K
R35
820K
TP58
TP57
TP56
TP55
TP54
C42
100n
C43
100n
C44
100n
C45
100n
C46
100n
FFC connector
22 pole
3.8V
HS-DET
C59
100n
(29~31)(32~35)
3.8V
D1-A
D2-A
D3-A
D1-B
D2-B
D3-B
2.2V LED ON
0V LED OFF
R12
R11
R10
R9
R8
R7
R22
R23
TP45
CHARGE
INH/RS
TP65
TP66
TP47
T12
T11
RED
GREEN
CS/CE
DISCLK
DISDATA
OERAQ
2.65V
SPLED
SP_AMP
R60
10K
(21~28)
(16~20)
D14
Green
D13
Green
D12
Green
D11
Green
TP64
R43
56R
TP43
TP44
T5
D4
D5
(11~15)
(10)
2.65V
C37
100n
R59
10K
sp_key
K5
K4
K3
K2
K1
K6
K7
K8
K9
K21
K15
K14
K13
K12
K11
K16
K17
K18
K19
K20
K25
K24
K23
K22
DL
R29
10K
IC3
VCC
2.65V
0V
GND
NC
WE
CE
OE
ADR00
ADR01
ADR02
ADR03
ADR04
ADR05
ADR06
ADR07
ADR08
ADR09
ADR10
ADR11
ADR12
ADR13
ADR14
ADR15
ADR16
ADR17
D0
D1
D2
D3
D4
D5
D6
D7
OERAQ
R9
22K
(2~9)
ADR[00:17]
(1)



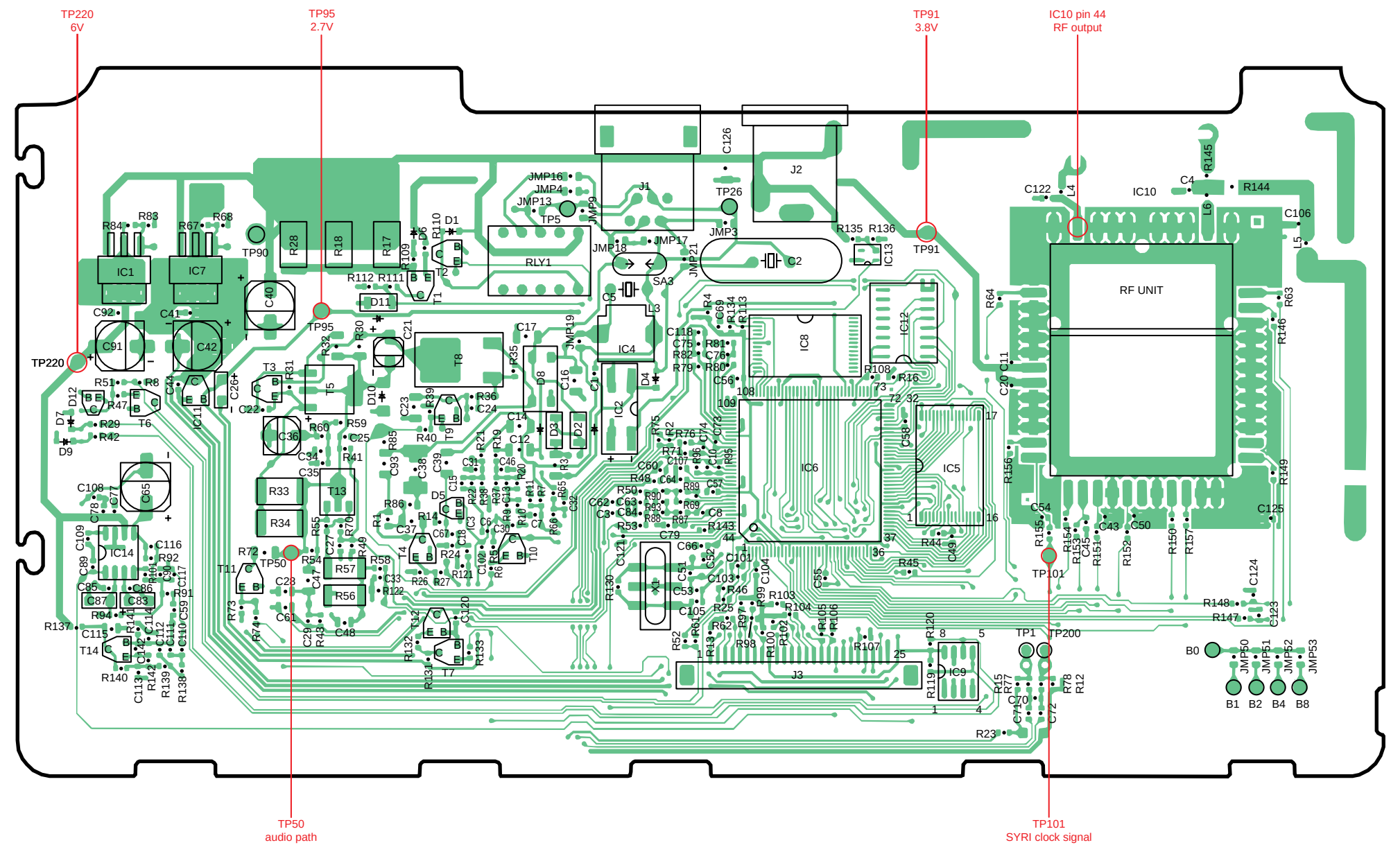
KX-TCD715EM: SCHEMATIC DIAGRAM (HANDSET) Main

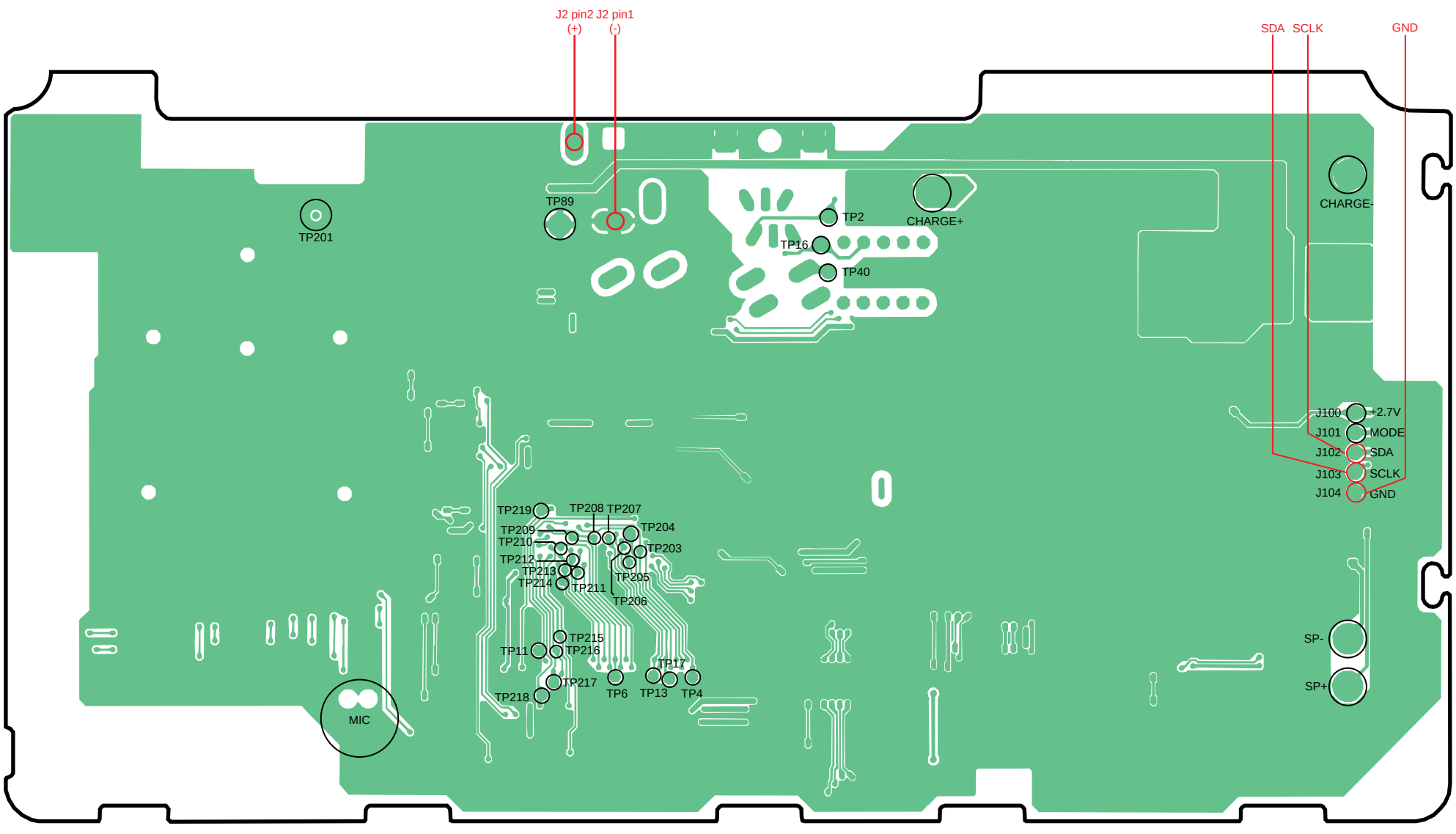

D3
D4
D5
D16
C58
C59
C1
R1
J2
R39
R40
C64
C63
C62
C61
C60
R13
C57
R4
T3
R7
T6
R7B
D14
R2
T1
R5
T4
D1
R6
T5
25
1
R3
T2
J1
D2
R9
R10
R8
R11
D15

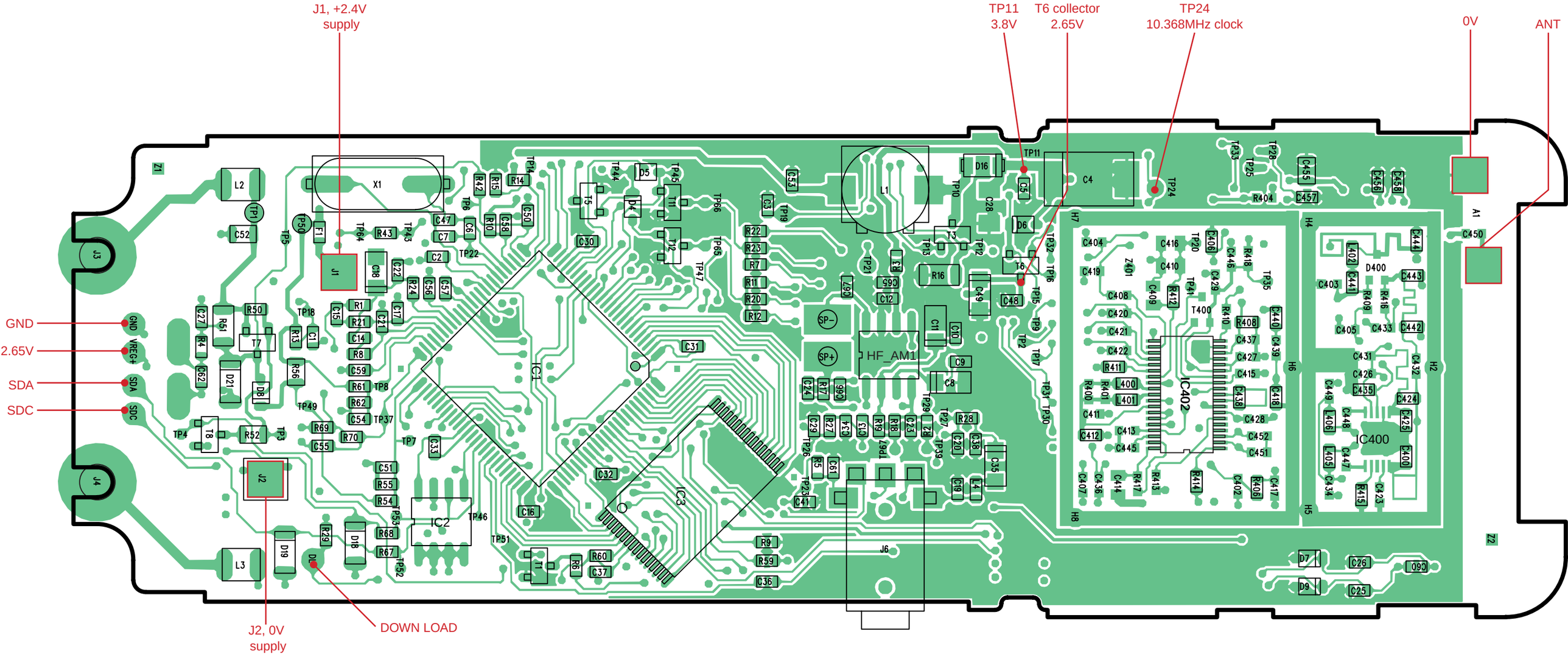

Answer LED
Answer
K10
Erase
K15
Memo
K20
Stop
K25
NewMsg
K31
Greeting
K5
K26 Up
Right
K27
Left
K21
Down
K22
Funk/OK
K28
Clear
K23
K1
1
K6
2
K11
3
Recall
K16
Voice Mail LED
K2
4
5
K7
6
K12
K17
Cancel
K18
In Use LED
Page
K24
Select
K29
K3
7
K8
8
K13
9
Redial
Sp Phone LED
K4
✳
K9
0
K14
K19
Mute
Mute LED
Sp Phone
K30



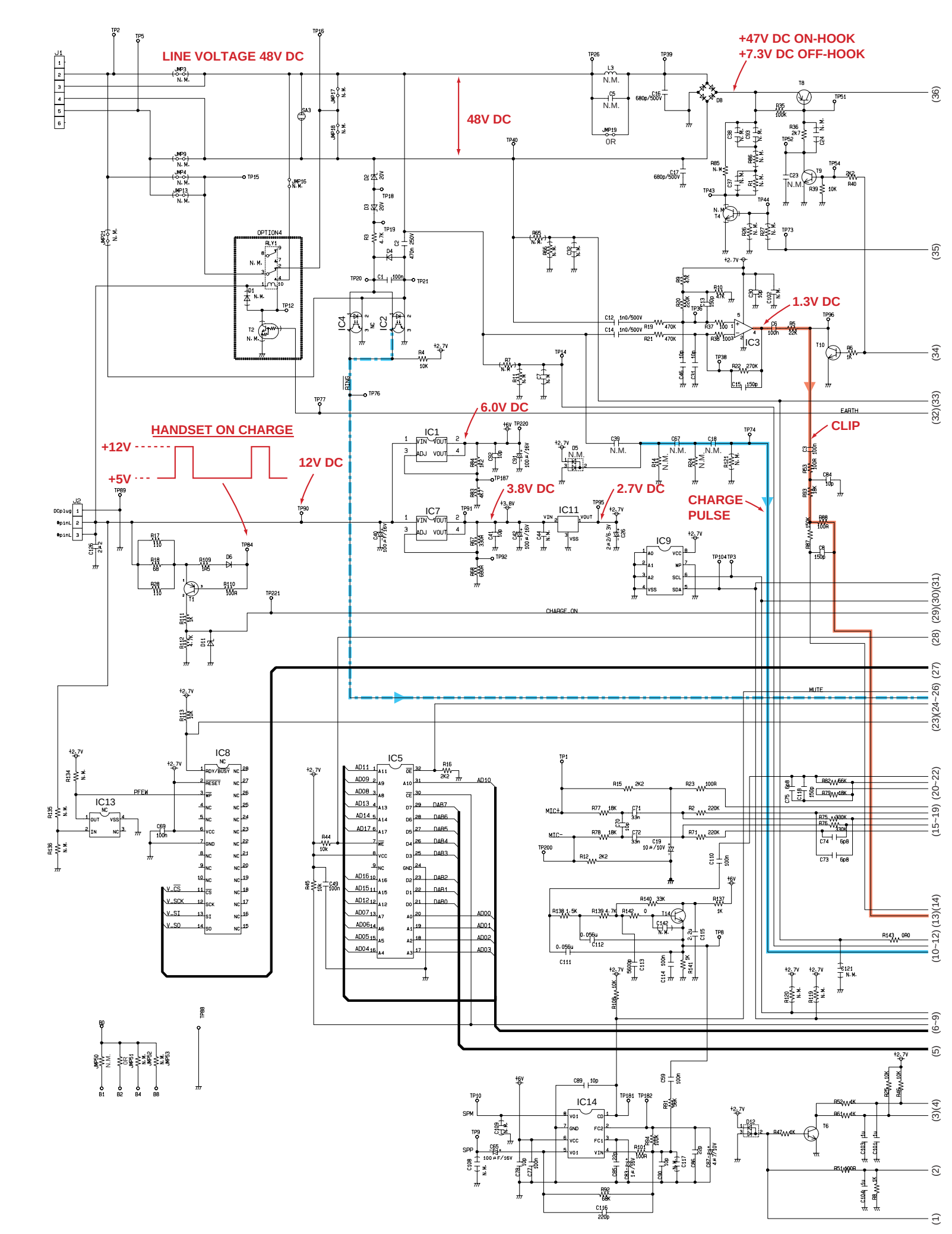
KX-TCD715EM : SCHEMATIC DIAGRAM (BASE UNIT) Keypad

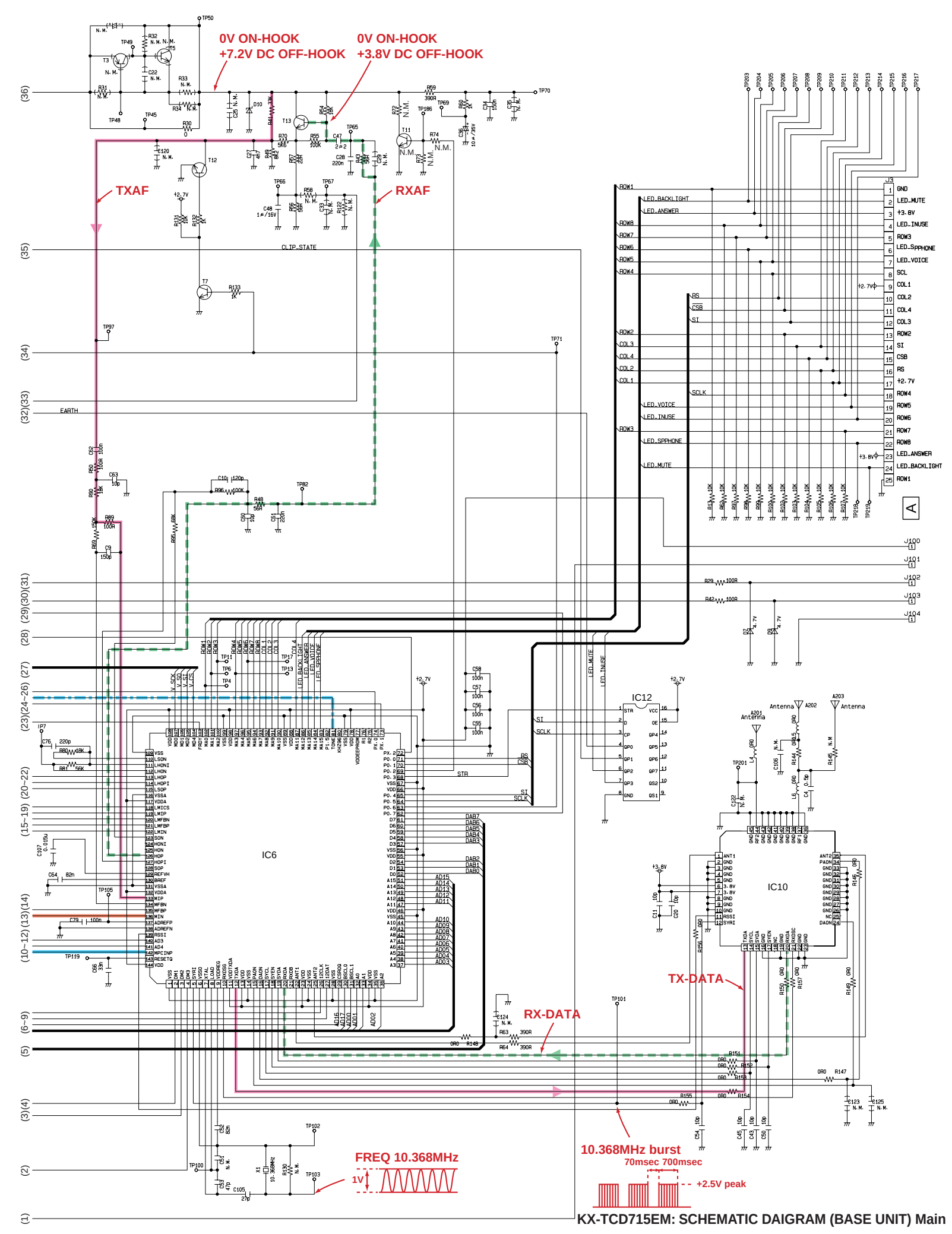

TP220
6V
TP95
2.7V
TP91
3.8V
IC10 pin 44
RF output
TP50
audio path
TP101
SYRI clock signal
RF UNIT
IC1
IC7
IC2
IC4
IC5
IC6
IC8
IC9
IC10
IC12
IC13
IC14
RLY1
SA3
J1
J2
J3
TP90
TP26
TP5
TP11
TP200
JMP16
JMP4
JMP13
JMP9
JMP18
JMP17
JMP3
JMP21
JMP19
B0
B1
B2
B4
B8
JMP50
JMP51
JMP52
JMP53


J2 pin2 (+)
J2 pin1 (-)
SDA
SCLK
GND
TP89
TP201
TP2
TP16
TP40
CHARGE+
CHARGE-
J100 +2.7V
J101 MODE
J102 SDA
J103 SCLK
J104 GND
TP219
TP208
TP207
TP209
TP204
TP210
TP203
TP212
TP213
TP205
TP214
TP211
TP206
TP215
TP11
TP216
TP17
TP217
TP6
TP13
TP4
TP218
MIC
SP-
SP+

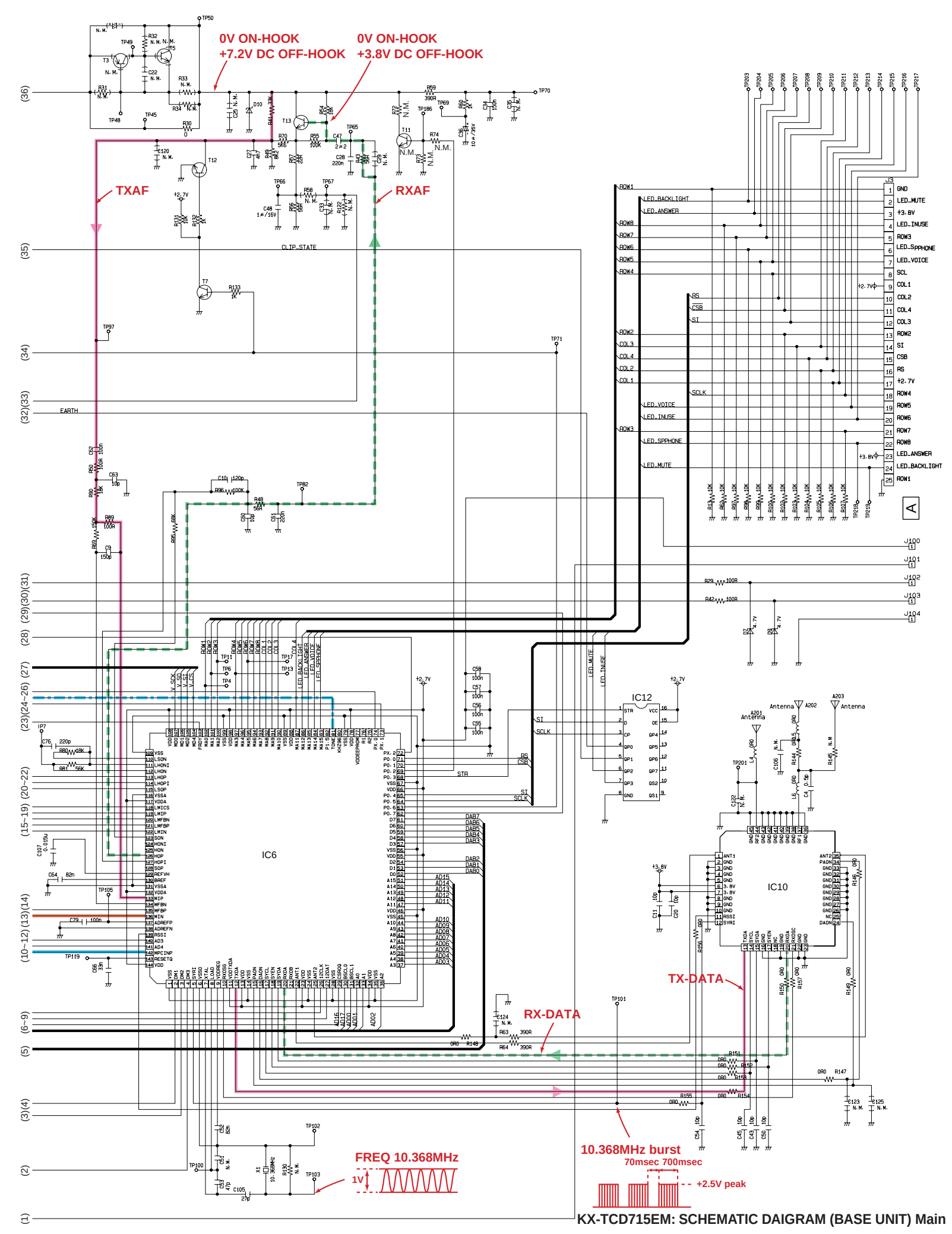

J1, +2.4V supply
TP11 3.8V
T6 collector 2.65V
TP24 10.368MHz clock
0V
ANT
GND
2.65V
SDA
SDC
J2, 0V supply
DOWN LOAD
HF_AM1
IC1
IC2
IC3
IC400
IC402

K25
K16
K15
K20
K19
K5
D17
K2
K22
D1
C39
C40
C64
TP42
TP62
TP61
TP60
TP59
R37
C63
TP63
TP41
R36
R35
TP58
C46
C45
TP57
TP54
TP55
TP56
C42
C43
C44
TP68
LS1
H1
Z4
D11
D14
K6
M1
K17
K14
K13
K8
K1
K11
K12
J5
D3
K21
D12
D13
K23
K18
K24
K3
K4
K7
K10
K9
D2
Z3

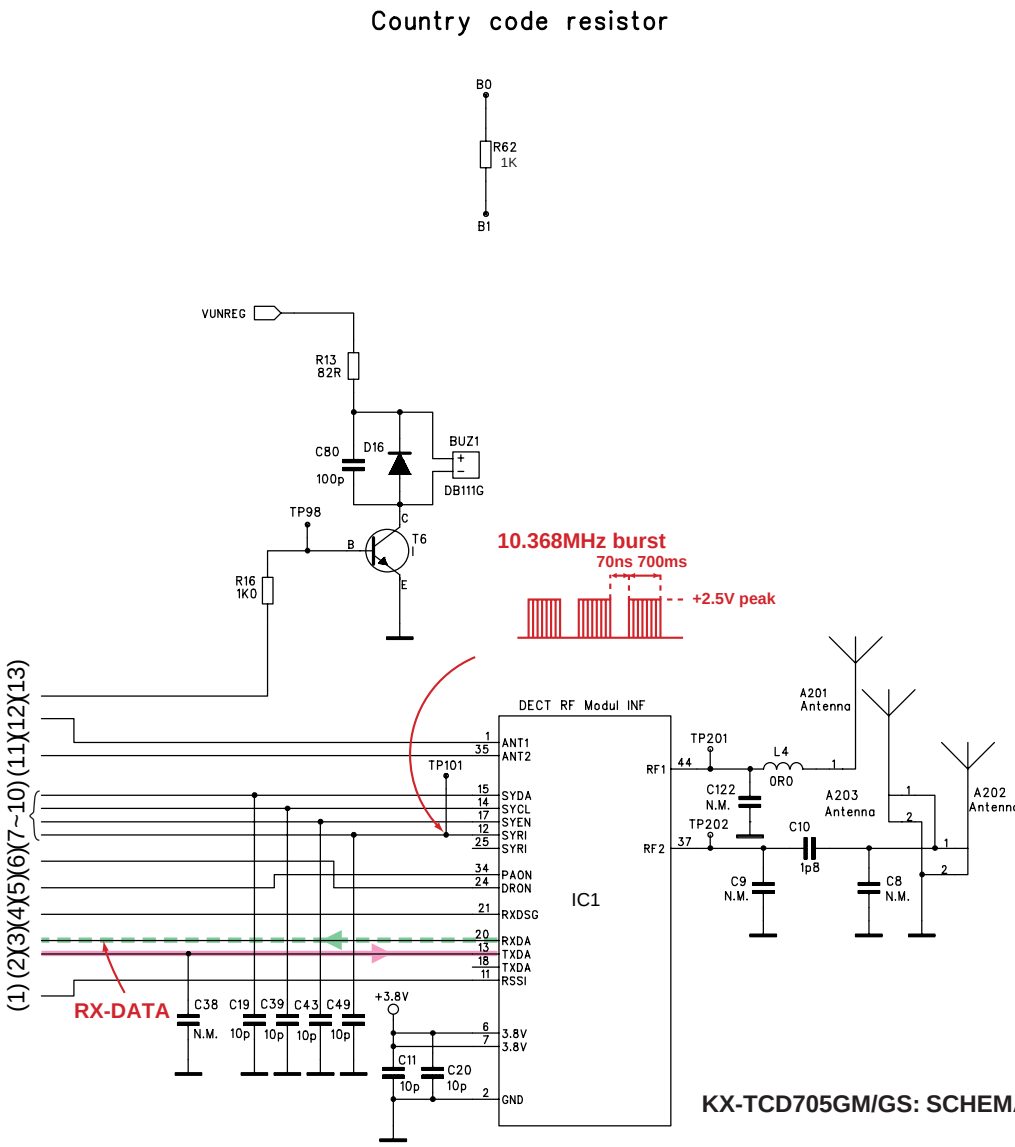

LINE VOLTAGE 48V DC
48V DC
+47V DC ON-HOOK
+7.3V DC OFF-HOOK
1.3V DC
6.0V DC
HANDSET ON CHARGE
+12V
+5V
12V DC
3.8V DC
2.7V DC
CHARGE PULSE
CLIP
EARTH
RING
CHARGE_ON
MUTE
PFEW
IC1
IC2
IC3
IC4
IC5
IC7
IC8
IC9
IC11
IC13
IC14
(36)
(35)
(34)
(32)(33)
(29)(30)(31)
(28)
(27)
(23)(24–26)
(15–19) (20–22)
(10–12) (13)(14)
(6–9)
(5)
(3)(4)
(2)
(1)



KX-TCD715EM: SCHEMATIC DAIGRAM (BASE UNIT) Main



KX-TCD715EM: SCHEMATIC DAIGRAM (BASE UNIT) Main



KX-TCD705GM/GS: SCHEMATIC DIAGRAM (Base Unit) Base Band